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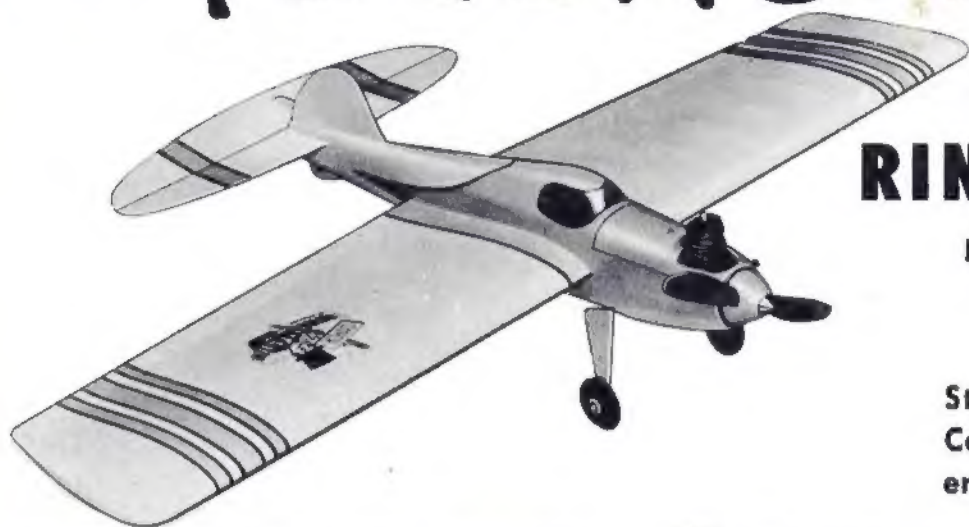
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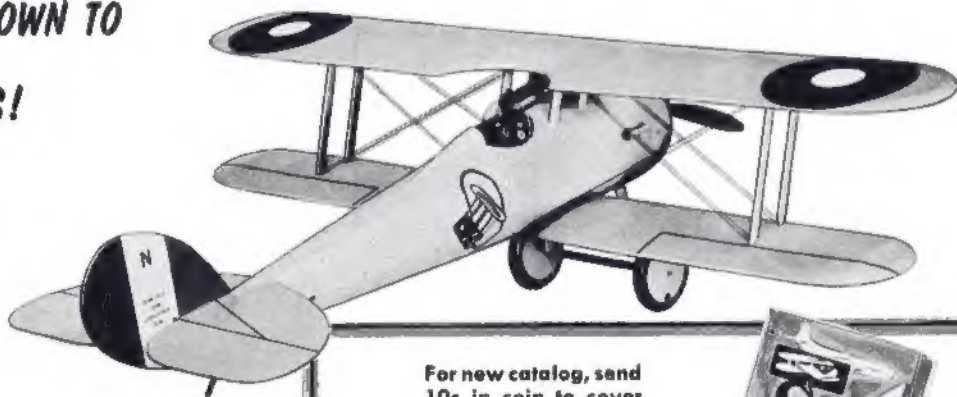
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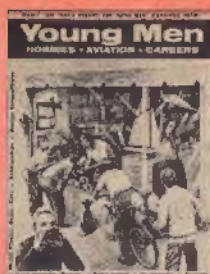
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Can anything be more exciting than when the long-awaited Super Duper 29's arrive at the local hobby shop? Harold Stevenson says "no" and has produced this cover to prove his point. Any resemblance between this engine and a real one is coincidental . . .

Young Men

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The Readers Write

Let's hear from you! Address all letters to the Editorial Office, YOUNG MEN, 304 East 45th Street, New York 17, N. Y.

Keen-eyed Zoologist . . . While going carefully through the August issue, I noticed, on page 50, the very fine photography of Lilo Hess. Especially interesting is the shot of the moth at the artificial blossom. Besides being a rabid model airplane builder I am also a collector of moths and butterflies and a zoologist by profession. The moth in the picture is not a promethea moth at all. The pictured insect is in a very different family known as the Sphingidae—the sphinx or hawk moth tribe. This one is a hog sphinx. The true promethea moth is larger and has no tongue.

Your magazine is excellent and is going a long way in keeping young (and old) Americans alert and interested in healthy, educational pastimes.

Richard C. Fleming, Bangor, Mich.

Is That You, Norman? . . . I was a bit startled to see me in July issue (P. 42). The caption is essentially correct, but not current. Since photo I have (1) served 1½ years in Air Force, (2) finished college, (3) married, (4) moved to Calif, and (5) worked 3½ years as engineer with Douglas Aircraft (El Segundo) in hydraulic and landing gear section.

*Norman F. Robinson,
Manhattan Beach, Calif.*

You Send Ice Cake, Shim? . . . How trouble that you make a good book!

I want you pardon me that suddenly I write this letter to you.

When Korean is hight tedious a long rains now when I see a notice this book. I should like to read this book. And I effort to get a this book, but

(Continued on page 10)

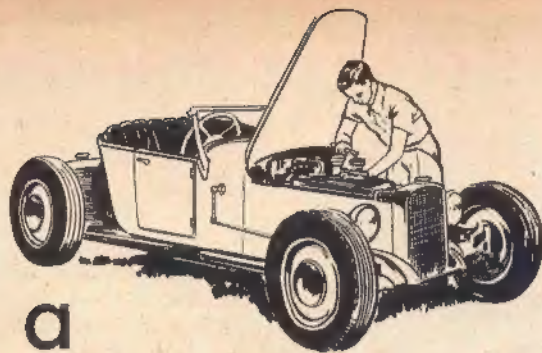
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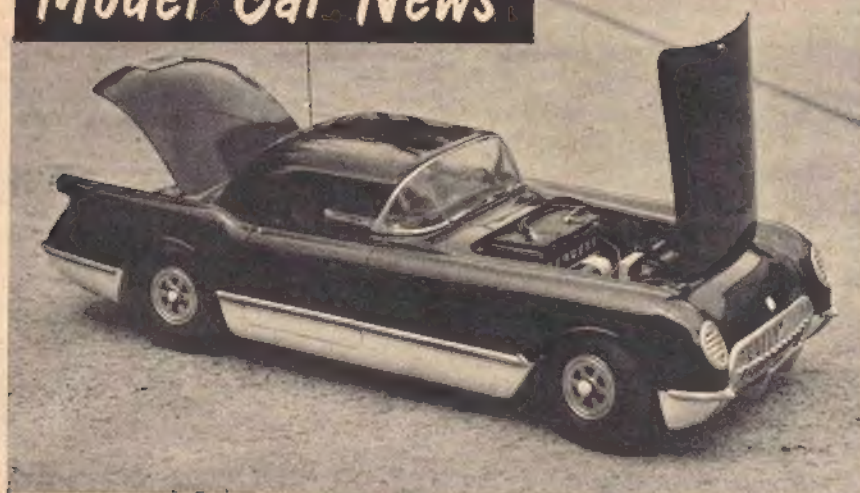
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Model Car News



No tickets of admission required here — you just need a genuine interest in miniature automobiles

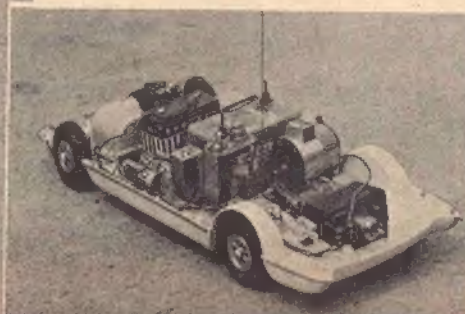
■ This very neat R/C car was made by Larry Nuesslein (3011 Greenleaf St., Allentown, Pa.) from an Ideal plastic model of a Chevrolet Corvette. As pix show, addition of drive and control apparatus did not detract at all from the realistic model. Larry used an E.C.C. 951B receiver, steering being accomplished with a Fenner-Pike actuator. The extra contacts on the latter are utilized to work a model train reversing relay, which gives forward-stop-reverse action to the drive motor. Latter is a Pittman boat unit, and some trouble was experienced getting a satisfactory drive setup; gears, pulleys, etc. were tried without much success. Larry finally hit on the idea of chain drive, using "ladder" chain, and this has done the job. It is very smooth with no slip, and the car really travels — Larry says its 7 mph speed was almost too fast for good control. He therefore installed an auto heater rheostat to slow it down. The 2-1 reduction drive that Pittman sells for their boat motors is used, and the drive



sprockets have 6 and 18 teeth, so total reduction from motor to rear wheel is 6-1.

Full size racers have a saying that "the fastest way around the track is not always the shortest," and Bob More (66 W. Elizabeth Ave., Bethlehem, Pa.) claims the same holds true for model racers. Reason is that with every car using exactly the same bridle and cable length, you often find two narrow oily paths around the surface, and excessive wheel slip on these paths prevents the car from clocking top speed. Rules say you can't shorten your bridle or line — but you can lengthen them! The drawing gives the idea, and Bob has found that the 1" of extra length is enough to allow good tire action on the track surface, while not penalizing the car too much by virtue of the extra distance it has to go on each lap. This trick can be worked with either pan-handle or two-lug systems, and it will pay you to carry the extra-length bridle in your tool kit at all times for quick installation when you have to run on a track with those two black "tracks."

In response to our urgent plea Carl Dunlavy (610 E. Grand Blvd., Corona Calif.) has sent us quite a few good racing tips that the boys have proven out at the Corona track. One of



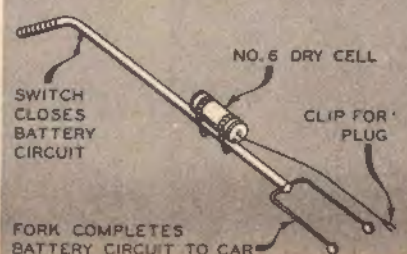
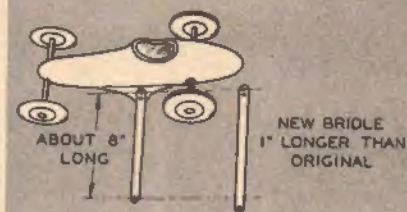
YOUNG MEN

them is seen in the sketch—a good use for the handle from a junked vacuum cleaner, and a darned good car pusher besides. The fork is bent to fit in the cockpit of the car (or adapted for this purpose according to your particular car) while a starting battery is strapped to the handle. You can wire in the vacuum cleaner switch, if desired—a good idea, since it will prevent battery shorts when the starter is not in use (but use heavy wire!) A simple clip fits on the hot terminal of the glow plug, and just pulls off when the car starts to accelerate. Incidentally, Carl saw the pic of the "mystery" car on page 16, June 1955 issue and says that he is quite sure the left hand car is a "Bremer Whirlwind," manufactured in Minneapolis, Minn. around 1938-39; Carl used to run one of these cars at Waterloo, Iowa, and Kansas City, Mo.

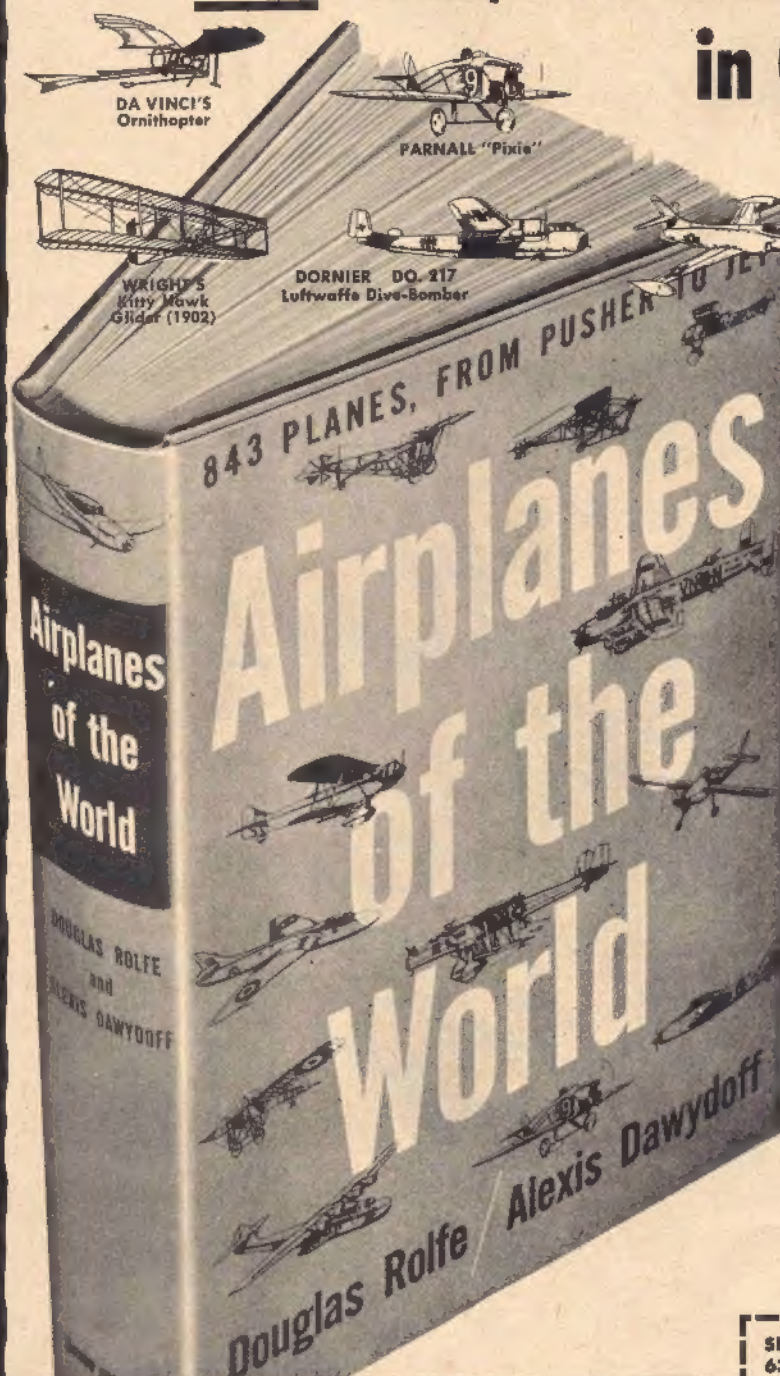
At races held in Bethlehem, Pa., Bob More says "Loose Lifted Loot," meaning Bob Loose from Reading. Loose roared around the Fox Speedway track in only two hundredths of a second under the coveted 150 mph mark, to reach 149.5. His running mate from Philadelphia — Al Winter — surprised everyone by hitting 149 on his first run. However, the strain must have been too much, for his second run was only 140.4. Bob himself had a tense battle with his fellow townsman, Howard Fox, who came out with third when Fox's last try ended with a thrown rear wheel. Nick Tucci of New York again had trouble with his beautiful Swedish car, this time carburetion; it hit only 136 mph—far under what the boys believe it can really make. In Manufactured Proto — the Stock Car class of the model world—Bill Geiger topped the field by 3 mph, considered to be a rout, as the times in this class are usually very close; he hit 127.11, while F. Wolfe was second with 124.82, and S. Lollo followed with 122.4. In the Spur Class: 1—Al Winter, 138.24; 2 — J. Petrakis, 136.35; 3 — H. Fox, 136.35.

Ohio Circuit Race at Cleveland showed these winners: Custom Proto. 1—Herb Herrel (Columbus) 140.18; 2 — Joe Feimer (Cleveland), 139.96; 3—G. J. Loughry (Akron) 136.36. All used own-make cars. Custom Sportsman. 1—E. Oliver, 128.20; 2—J. Oliver, 127.47; both

(Continued on page 85)



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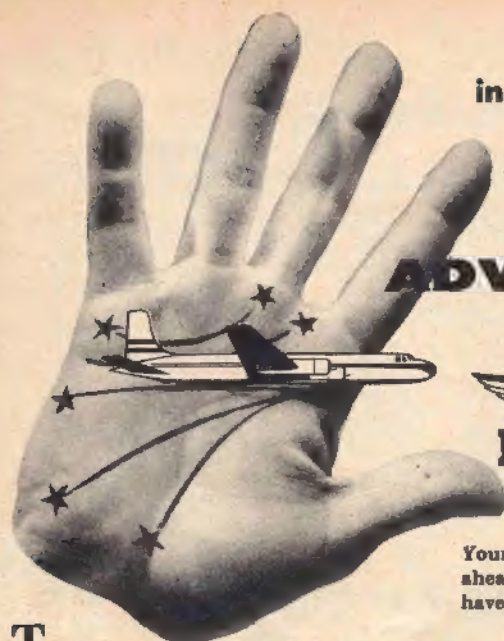
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(Continued from page 4)

there are not this book in Korea, and so I did not control that mind of should like to read this book because I see a notice this book on certain magazine. That book is Air Progress. And so I was going to get a some money for buy a this book and so I go to school at day, and I sell a ice cake at night for buy a this book, but I did not get any money, but I did not control that mind of should like to read this book once more. And so I write this letter to you. I want you give me a this book. If you do not permission my ask.

You pardon this Korean self supporting student. I do not forget your kind as long as I live. Here Korean of my home's garden rains now.

*Shim she chin, 13 Get Dong,
2 Chong Ra St., Seoul, Korea*

USAF Academy... If you have any information about the new U.S. Air Force Academy in Colorado Springs, I would greatly appreciate it if you would send some to me.

James Zartman, Huntington Park, Cal.

● We plan to present a complete report on the Academy in an early issue.

Howdy-Young Men!... Just a note to offer my congratulations on the new name of "Young Men" for your wonderful publication which heretofore has been called Air Trails in various different forms.

I am quite certain, being acquainted with this Street & Smith publication now for the past 20 odd years or so, that the contents will retain their high standards.

You may also be certain that as advertisers for the past nine or ten years, we will continue to give you whatever vigorous support we possibly can. We would like to take this opportunity of thanking you for making a publication such as yours available not only to us for advertising, but to the general public as the top source of information for all matters relating to hobbies. Wishing you every success, I remain,

*Ed Manulkin, President,
Sterling Models,
Philadelphia, Pa.*

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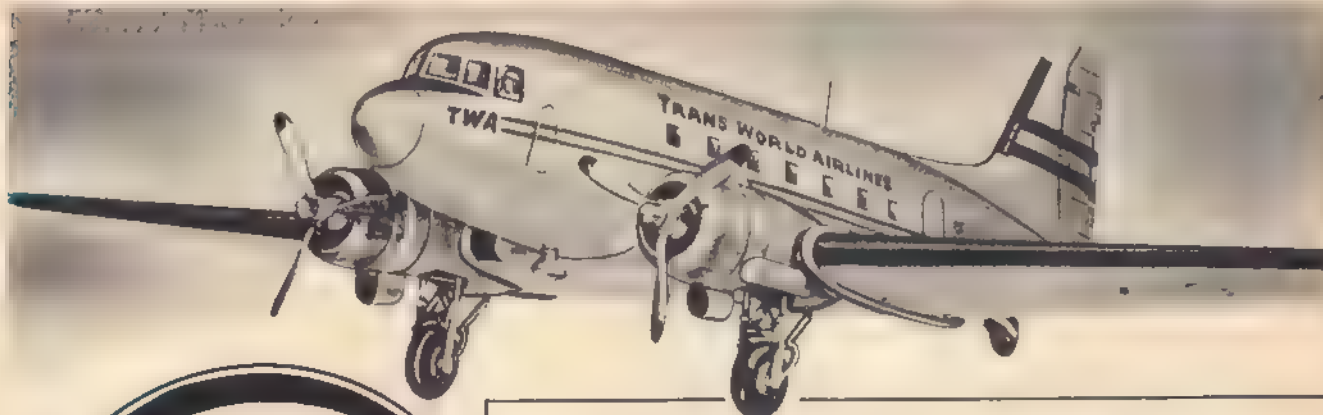
"You Can Depend On Your
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From Italy... I have with real pleasure noticed the fine display of Italian Air Force's World War II planes on pages 38 and 39 of the May issue of A.T.H. Anyhow, I regret having to inform you that the words "Reggia Aeronautica" have no meaning on this case as the word Reggia means king's home or Royal Palace; you should have written Regia Aeronautica; Regia=Royal and Aeronautica=Air Force. For what concerns the drawing for the Meridionale Ro.43 on page 39, I have to inform you that the lower wing was a straight one, without any inverted dihedral while the upper was a gull wing as is.

A. W. Mizzan Jr., Milan, Italy.

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Everything Under Control!



**News, Views, and Comment
on Radio Control Activity
and Equipment as reported
by Howard McEntee, W2SI**

■ A real startling R/C plane is seen here—a 1½-size copy of Roy Clough's "Space Ship." It was built by Jim Smith and the pic was sent to us by Dale Root (6036 Telegraph Ave., Oakland 9, Calif.), who says it was never flown by radio, since Jim had all sorts of radio trouble; the craft was fitted with a Cub .14 engine and did quite well as a plain free-flyer. It is known locally as "The Thing." Dale's wife Jean holds the model. Another of Jim's efforts is the scale Fokker D8; we have no flight reports on this one, since Jim had to go East shortly after it was built. He left the plane with Dale and told him to fly it, but Dale didn't since he said he "would rather Jim did his own repair work!" Dale himself is shown on page 60 holding the attractive shoulder winger known as the "Ascender." Descriptions of this very successful flier have been given in past issues, and we note that it took 5th place at the Nats for its owner.

Since proportional control seems to be gaining in popularity, we feel a simple actuator (page 58) will be of interest. This is a design by John Worth (Box 9, Hampton, Va.). It combines the advantages of the iron-core and the "ironless" styles of actuators; should be ideal for small planes. John has it in a scale

Curtiss Robin. The bobbins are those intended for escapements, and come with the fibre end pieces already in place. In his own unit, John used double windings on each core, wired so polarities of the electromagnets oppose both poles of the disc magnet at once. This proved very efficient and probably "worth" the extra trouble to wind them; however, use of the Control Research escapement forms wound full of #34 wire would probably do a good enough job and be much simpler. For Half-A planes, a ½" thick disc magnet would doubtless be husky enough, but for more pull, the ¾" x ¾" size should be used. Magnetic pull (with no current through the coils) will tend to rotate the magnet and crank to a position 90 degrees from that shown, so spring centering will have to be used to hold the rotor at the neutral illustrated.

Control of maximum power on a two speed engine gave Arnold Reed (80 16th Ave. North, Fargo, N. D.) a bit of trouble till he evolved the rig sketched on page 12. He has fitted it to a 2-speed K&B .19, and finds that with 1/32" of air holes open the engine will turn a 10/4 prop about 6000 RPM. Each quarter turn of the screw increases RPM about 500 turns, with full speed obtained when the holes are half open.

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ORIGINAL VALVE
USED FOR
HIGH SPEED



NO. 10-32 MACH. SCREW
1/8 IN. DIA. HOLES-
FRONT AND BACK

ORIGINAL INTAKE

No difference was noticed between this setting and the original wide-open intake before the restrictor was installed. A simpler installation of the same arrangement was made on a Vivell .35, a single speed engine, the unit extending only ¾" above the top of the venturi in this case. Virtue of such an arrangement is that an engine larger than necessary can be installed, and the top speed cut down to suit conditions, but you always have reserve power if it is required.

Safety considerations in all model activities are a must, of course. Most active R/Cers have seen or heard of cases where radio planes have hit cars or houses; an R/C plane out of control is especially dangerous, since such planes are usually heavy and fly fast, as compared to free flight jobs. At the same time, R/C flying is so fascinating that spectators flock to the site of such activity, and their control is a real headache. We have received a clipping from a Florida newspaper, stating that a woman spectator at an R/C event was hospitalized after being struck by a plane, her injuries including a fractured skull and lacerations on one eye. The paper reported that the plane was thrown off its course and out of control by the wind. We have no way of knowing exactly how the accident happened, but let's keep in mind that all such accidents get full publicity in the papers regardless of who might be at fault. So keep your planes well away from any area where spectators gather, and warn them of the possible dangers involved if they insist on flocking around your launching area.

We learn that the influential Western Associated Modelers has taken cognizance of the growing list of R/C accidents and appointed a committee to check into safety procedures and suggest remedies. Individuals and groups on the West coast active in R/C are urged to get in touch with W. Hittenberger (1242 Virginia St., Redwood City, Calif.) if they have any ideas on possible safety rules and procedures.

A complete story on the R/C Event at the Nationals will be along; the following notes are taken from an early report sent to us by Howard Bonner, who was Director of this event. He says there were 27 contestants registered to fly in Multi, 21 of whom made official scores, while 46 signed up for Rudder Only, and 40 of these racked up points. It is apparent that the event ran off very smoothly; Howard had secured three monitor receivers complete with operators from the Navy, with the result that there wasn't a single claim of interference. Only a single flight line was used, as there were no contestants on 465 mc and only five on frequencies (Continued on page 58)

Jim Smith's R/C Fokker D8 has 480 sq. in.; 42 oz. with Deltron; motor, rudder only.



POLK'S—FIRST IN RADIO CONTROL!

ARISTOL LORENZ 3D-2 TUBE RECEIVER

Designed by E. J. Lorenz
Uses diodes and printed circuits
Lowest tube idle
Low filament drain
KIT PRICE



\$8.95

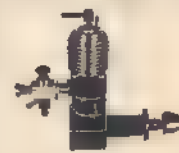


ARISTO MULTI-TESTER

Designed expressly for R/C Full 2 1/2" meter. Sturdily built, accurate testing unit covering EVERY R/C need $\pm 2\%$. This is NOT a reworked surplus test meter! Moving coil type meter. All readings to 1000 MA, 200 V DC, 100 to 10K ohms. Zero adjusting screw. Ohms adjust. Black and red test leads with prods supplied. High-impact, black plastic case. Detailed instruction book.

\$14.95

MILLS with TWO-SPEED THROTTLE



SPECIFICATIONS
Displacement .081 cu in.
Bore .406 in.
Stroke: .625 in.
Weight: 3 1/2 ounces
Max. B.H.P.: .093
at 10,000 rpm

Power ratings: .07 B.H.P. per cc.

Max torque: 12.4 oz in.
at 5,000, 6,000 rpm.

\$13.95

ARISTO-REV MOTOR



as described by
McEntee & Lorenz
Length O.V.A. 2 1/4". Double ball bearing. Max diam. 1". Wgt. 2 1/4 ozs. Carbon brushes. 4800 RPM on 3 volts or double RPM and power on 4 1/2 volts. Amazing 1/100 amp. drain. Approx. 40 hours on 2 Pence!!

\$2.95

LOW PRICE.

CLOCKWORK ESCAPEMENT

Ideal for marine use, self-powered with an enclosed spring wound motor. For 2 or 4 position operation.



\$11.50

Wt. 3 oz

COMPETITION SPECIAL

.12 DISPLACEMENT
WITH CUT-OFF

3" high, 4" long, 1 1/4" wide. Can develop 1/2 HP. Total wt. 6 oz. Thrust 16 to 18 oz. Bore 1/2". Stroke 3/4". 6500 RPM. For planes with 3 to 5 ft span.



\$13.95

E.D. BOOMERANG RECEIVER AND ESCAPEMENT



- Longer tube life
- Antenna NOT critical
- Range exceeds 1 mile
- Compact, small size
- No soldering
- Special low drain escapement

\$29.50

- Printed circuit
- Free Band
- Whip Antenna
- Keying Card
- Crystal controlled



TRANSMITTER
\$29.50

E. D. Aristol Unit Complete **\$57.50**
With Escapement

POLK'S

model craft HOBBIES

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New York 1, N.Y.



...are cordially
invited to visit
our 5-story
WONDERLAND
OF HOBBIES
...the world's
leading
hobby house

SCALE MODELS

5 PLAN PACKETS (32 Plans)

In detailed 1/4" = 1 ft. Scale \$2

(Includes 1PP 5PP) **INDIVIDUAL PACKETS \$1**

Packet #1PP—FIGHTERS: Lockheed Lightning P-38 13; Hawker Typhoon 10 1/2; Focke-Wulf 190A3 8 1/2; Spitfire IX 9 1/2; Vought Corsair P4U1 10 1/2; DeHavilland and Mosquito 13 1/2;
Packet #2PP—FIGHTERS: Bell Alacobra P39C 8 1/2; Republic Thunderbolt P47 10 1/2; Stormovik IL-2C 12 1/2; Grumman Hellcat F6F 10 1/2; Mitsubishi S-00 10; North Amer. Mustang P51 9 1/2; Grumman Avenger TB8F 13 1/2;
Packet #3PP—FIGHTERS: Northrup Black Widow P61; Hawker Hurricane 10; Hawker Tempest 10; Bell Kingcobra P38 8 1/2; Douglas Dauntless SBD 10 1/2; Bell Alacomet P68A 12 1/2; Messerschmitt 109G16 8 1/2;
Packet #4PP—World War I FIGHTERS: Fokker D7 7 1/2; Sopwith Camel 7; Fokker D8 7; Nieuport 17C.1 6 1/2; Spad 13C.1 4 1/2; Albatross DVA 7 1/2; SE5a 8 1/2;
Packet #5PP—BOMBERS: Martin Marauder B-26 18; North Amer. Mitchell B-25 17; Consolidated Liberator B-24 27 1/2; Avro Lancaster 36; Boeing Flying Fortress B17G 36.

**SINGLE
PLANS
25c**

Full size working plans of famous control line and free flight gas models. No drawings to enlarge. Ribbs, bulkheads, construction views are included. Photos and sketches show extra details.

FOLIO No. 1

1. Albatross
2. Fokker D8
3. The Hen Cat
4. Curtiss Helldiver
5. Telford Trainer

FOLIO No. 2

1. Fokker Pursuit
2. Fokker C
3. Hall Special
4. Gee-35
5. Hall Racer

FOLIO No. 3

1. A.T.S. Flying Lab
2. Stahl's Corsair
3. Cloud B
4. Copperhead
5. The Bob Cat

SUPER SPECIAL: SAVE \$6.00

107 PLANS—\$9 value—ONLY \$3.00 Ppd.
(45 Control Line Scale & 62 1/2" Scale Plans)

SIGMA RELAYS

New—guaranteed—factory tested and adjusted. Corroded and sealed for your protection. The heart of your receiver can not be surplus—ACCEPT NO SUBSTITUTES! Series 4F (8000 ohms)....



\$6.00

26F (8000 ohms) **\$8.50**

CRYSTALS

Guaranteed and tested $\pm 0.04\%$
27 255 mc

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ARISTO CRAFT MOTORS

Powerful double permag — high efficiency, low drain, light weight, red-mount, 1.5 to 6 V battery operation

1	1.25	3	2.00
2	1.50	4	2.50

Special heavy duty for R/C boats, cars, etc. Carbon brushes, high torque.

5 **\$4.95**

PROPELLERS

Guaranteed unbreakable, plastic, specially designed for high engine performance — makes starting easier.

Size	Price, ea.	Size	Price, ea.
6 x 4	\$.79	9 x 8	\$1.50
7 x 8	\$1.25	9 1/2 x 4 1/2	\$1.25
8 x 4	\$1.25	10 x 8	\$1.75
8 x 8	\$1.25	11 x 5	\$1.75

DETAILED PLAN PACKETS \$1 EACH

**SINGLE
PLANS 25c**



Finest plans of lowest prices! Figure after model is wingspan inches; CL—control line; FF—free flight; amb—small class B engine; lgC—large class C engine.

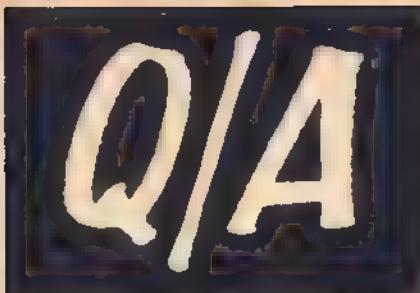
CONTROL LINE SCALE MODELS

1 inch = 1 ft. size; complete description Packet #10PP—FIGHTERS—All ABsmC: Hawker Typhoon 38 1/2; North Amer. Mustang P-51 36 1/2; Spitfire IX 37; Focke Wulf 190A3 34; Vought Corsair 38.

Packet #12PP—FIGHTERS: Bell Kingcobra P-63 37 1/2 ABsmC; Messerschmitt 109 32 ABsmC; P38 Lightning 52 BC; Hawker Tempest 34 1/2 ABsmC; Douglas Dauntless SBD 40 ABsmC.

Packet #14PP—LIGHTPLANES—All AB. Piper Sky-cycle 30; Johnson Rocket 31; Globe Swift 29; Ercoupe 30; C. V. 29.

Packet #15PP—NATIONAL AIR RACERS: Gee-Bee 25AB; Howard Ite 30 lgC; Peco Spec. 25 BC.



What's your question? You ask 'em and YM's Experts Advisory Board will do its best to supply the answers

Trainers by Waco? . . . How come Waco never built a military trainer like the Stearman? After all, it was one of the bigger airplane manufacturers just before the war.

Steve Smith, Aurora, Ill.

● Waco did produce a primary trainer, the PT-14, pictured here. However, less than 20 were delivered to the Air Force. The majority, carrying civilian designation UPF-7, were used by the Civilian Pilot Training Program (CPTP) as advanced trainers for acrobatic work.



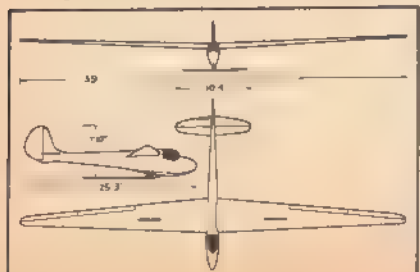
Waco Military Trainer

Soaring With a French Accent . . . I am interested in gliding abroad and I heard that France has one of the biggest movements in the world. Is this correct?

John Bernard, Bedford, N. Y.

● That is true. Soon after the end of War II, France realized the importance of air preparedness and launched an extensive program to build a large pool of future pilots by encouraging gliding activities. The aircraft industry was given orders to design and construct gliders and sailplanes. One of the first was the

First postwar designed French sailplane, Air-100



high-performance Air-100 designed by France's famous aeronautical engineer Raymond Jarlaud and built in quantity by Arsenal Aeronautique. At the present time France has around 400 glider clubs and approximately 2500 gliders.

Airborne Look . . . Did pilots of military airplanes always look like Men-of-Mars? I am too young to remember what they wore during the last war.

Jimmy Pierce, Sierra Madre, Calif.

● During the "old days," when airplanes were slow and flew low, the pilots did not need the "hard hat" and "space suit" regalia. Here is a typical fighter pilot working uniform consisting of a soft leather helmet, with fasteners for the oxygen mask, goggles, leather jacket and "Mae West" flotation gear which inflated by



The old look

CO₂ cartridge in the event of forced landing in the water.

City Ports . . . Are there any large airports located "downtown" inside a city? Most of them are far on the outskirts and take a long time to reach.

Paul T. Sherwood, Philadelphia, Pa.

● Photo shows the model of Germany's famous Tempelhof airport located in the heart of Berlin. It suffered considerable damage from Allied bombing, but is now almost completely restored and in operation.

High Flying Congressmen? . . . Are there any military pilots among Senators and Congressmen in Washington?

Thomas Glück, Monroe, Mich.

● A number of members of both houses are former military pilots or were connected with military aviation during last war. Quite a few of the Congressmen, incidentally, have also been members of the Congressional

Flying Club (photo at right) organized by them before the war.

What's the Difference? . . . Been following your model race car news with interest, but am a bit confused between the Arrow and Fox cars. Could you run some comparative pictures for mixed-up modelers like myself?

Al Graham, Quincy, Mass.

● Herewith, Al, inside and outside shots of the Fox and Arrow.

Plans for Gyro-Glider . . . You had an article and picture on the Gyro-Glider. I wonder if you can get plans for the Gyro-Glider, and the price.

Paul Bobst, St. Charles, Iowa

● For information regarding the Gyro-Glider write to Benson Aircraft Corp., P.O. Box 2621 Raleigh, North Carolina.



Airport inside city

To contact Paul Kotze . . . I want to find out the address of Mr. Paul Kotze, the rebuilder and owner of the Thomas-Morse Scout which you featured in Air Progress for last year. I have some questions to ask.

Leonard E. Opdyke, Milton, Mass.

● You can contact Paul Kotze c/o Grumman Aircraft Engineering Corp., Bethpage, L.I., New York.

Army Target Drone . . . Our school has the opportunity to purchase an army target drone less radio and actuators. The drone is the standard type used around World War II with a 12-foot span, powered by a Righter engine driving counter-rotating props. We are seeking information regarding performance data, speed, handling characteristics, and anything that might be of value in deciding whether or not it is a feasible project. If practicable we intend to supply the radio equipment as we have the facilities of a radio department. However, we do not wish to acquire a plane that is impossible to handle. If you do not have any information regarding this could you suggest a possible source?

Bro. Paul Koller, St. Joseph High School, Cleveland, Ohio

● This airplane had a top speed in the vicinity of 140 mph and as far as we know handled quite normally with the exception of occasional malfunctions such as engine stoppage, radio gear failure and the refusal of the parachute to open. As you undoubtedly know, it was launched from a catapult as otherwise it would require a long run on the ground to get off. It de-





High ranking pilots

scended in a fast steep glide and because of its weight represents a rather dangerous weapon, especially in the event of radio control or parachute failure. In our opinion a standard radio control model either designed by your group or from one of the kits available on the market would be much more suitable.

However, if you desire to obtain performance and handling information on the OQ, we suggest that you contact Captain Adam J. Stolzenberger, Vice-President, Dynamic Devices, Inc., 125 Sunrise Place, Dayton, Ohio. Captain Stolzenberger has probably had more experience with radio-controlled target drones than anybody we know of. He was stationed at Wright-Patterson AFB until three years ago and was in charge of the Dynamic Testing Laboratory where most of the experimental work with radio controlled aircraft such as drones and dynamically similar models was conducted.

Biggest British Bomber... What were the biggest types of bombers used by the R.A.F. from the beginning of the war up to about 1941? I would also like to know if any of these were Lancasters and where some were sta-

tioned. Specifically: (a) No. of engines. (b) No. of crew positions and jobs. (c) Armament details of all guns.

David L. Thomasson,
Santa Ana, Calif

• The largest British service bomber of World War II was the Avro Lancaster which measured 102 ft. span and weighed fully loaded 68,000 lbs. It was armed by two .303 caliber machine guns located in four hydraulically operated turrets, one in the nose, one on top of fuselage, one below, and one in the tail; this last had four machine guns. The bomber carried a crew of seven.

Larger than the Lancaster was the Lincoln, which came out at the end of the war, too late to be in active service. The plane had a wingspan of 120 ft., gross weight of 82,000 lbs. It was armed by two caliber .50 machine guns in the nose turret, two 20-mm cannon in the dorsal turret and two cal. .50 machine guns in the tail turret. This bomber also had a crew complement of seven.

The Lancaster was powered by four Rolls-Royce Merlin engines of 1280 hp each, the Lincoln by four Rolls-Royce Merlin 85 engines of 1635 hp each.

A-26 and B-26... A friend and I are debating over the B-26 and the A-26. He says that the B-26 was used in the Korean War. That I agree with. But he says that A-26 was not used in the Korean War. I don't agree with that because he says that the B-26s were designated as A-26s and never in the war. They were called A-26s in Korea by the Air Force pilots and crew who flew them. Let us know whether I am right or wrong.

Lawrence Vander Hoek,
Lakewood, Calif.

• The Douglas B-26 Invader was used in the Korean War. It was formerly known as A-26 but redesignated as B-26 around 1945 when the Air Force dropped the prefix "A". Therefore, there were no A-26's in the Korean war. Only the Navy has the designation letter "A" for attack now.

Hoppi-Copter... In the July 1954 issue of "ATH" you had an article about the new "Hoppi-Copter." I would like to have all the information I can get on it, such as cost, etc.

Eddie Watson, Claude, Tex.

• For information on the Hoppi-Copter write to Capitol Helicopters Corp., P.O. Box 1023, Schenectady, N. Y.

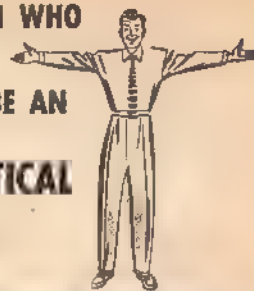
French Home-Built... Please send me information on how I can obtain plans for the plane Bebe Jodel, F-PEPF, designed by Joly & Delmontez, in last year's issue of Air Progress.

Obediah Stokes, Medina, Tex.

... I couldn't help but get interested deeply in the section of Air Progress on "French Home-Built." There were three which interested me. First and above all was "Pinocchio," single-place monoplane built by Claude Piel. Secondly was Roger Druine's "Turbulent," third, V. Chapeau's "Levrier," and lastly, Bourdin Autoplan (Flying Flea Modification). I am in hopes that

(Continued on page 87)

TO THE MAN WHO WANTS TO BE AN AERONAUTICAL ENGINEER



If you are one of the many ambitious men who would like to "get into engineering" ... but cannot afford the time or cost of four years or more in college ... this message is for you.

You can get into the aeronautical engineering field, with a genuine engineering job and pay, after two years of training at Northrop Aeronautical Institute.

AT NORTHROP, you take an intensely practical, "no frills" course. Your instructors are "production-conscious" with practical experience in the aviation industry. Many have been major executives of the largest airplane companies.

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Join the many Northrop graduates who are highly paid key men in the industry. As your first step toward success, write for complete information. Mail coupon below. Do it today!



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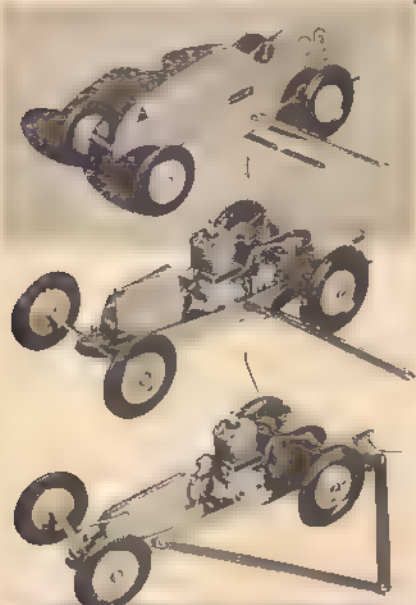
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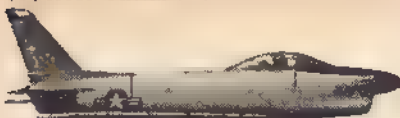
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Please send me immediately the Northrop catalog, employment data and schedule of class starting dates. I am interested in:
☐ Aeronautical Engineering Technology
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Name _____ Age _____
Address _____
City _____ State _____
Veterans Check here] for Spec at Veteran Training Information.

Custom Proto Fox Car (top two pix) and
Manufactured Proto Arrow Car



NORTH AMER. SABRE JET F86D



New Kit Now Ready for Immediate Shipment
24" Span Uses 150 Jetex motor. An exact scale model. Plan shows motor installation. \$4.00
Const. set less motor.....

OTHER GAS MODELS

Vought F2G Gas Model \$7.00
48" Curtiss P40F Set 9.00

REPUBLIC P47D GAS MODEL



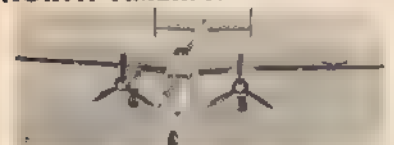
33 1/2" span, 1/4" scale. Length 30 1/2". One-piece moulded, clear plexiglas cockpit enclosure. 2 1/4" scale alum. disk rubber wheels. Body planking full size plans. Uses B or C motor. \$5.95
Set

9' TAYLOR CRAFT GAS MODEL



9 foot Span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers. 14" carved prop, Radio Control box, 3 full size plans, printed bals, silkspan, etc. Uses "C" type motor, single, twin, or 4 cyl. motor. Set \$17.50
without motor or wheels.
Extra pair of 4 1/2" airwheels, \$2.50

NORTH AMERICAN B-25 GAS



67" Span. 1" Scale. Free flight or radio control. Set has two 4 1/2" alum. cowls, scale rubber tired Veco wheels, planked type body, full size drawing, etc. Model uses two "19" or "23" type motors. Const. Set, less motors \$20.00

Curtiss P11C4 N. American B-25



32" span, 1" scale. Const. 38 1/2" span, 1/4" scale. Can set. Rubber driven ..\$4.50 set. Rubber driven ..\$4.00

Grumman F1FI



32" span 1" scale. Const. Elf 1-3 h.p. 4 1/4" wide. set. Rubber driven ..\$4.00 Price\$49.50

BOEING PT17 GAS



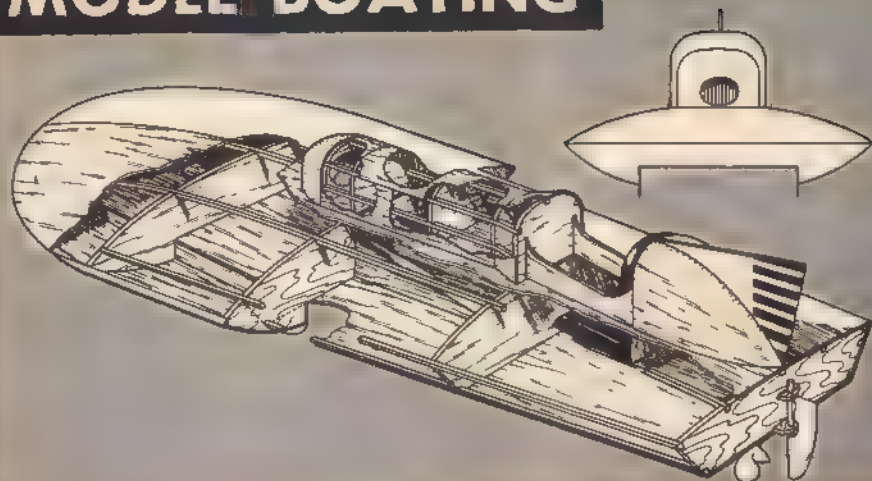
45" Span. Can use B or C type motor. U control. Set has scale rubber wheels and all spec. parts, ready cut wing ribs, 5 1/4" aluminum cowl. \$9.95
Const. set

Add 25c for postage. Catalog—10c coin

MINIATURE AIRCRAFT CORP.

Box 6, Staten Island 14, N. Y.

MODEL BOATING



Radio control enthusiasts take over during this session; Catalina attempt talked up

■ "Because of the fact that I have been interested in boat racing for many years," reports Major Morris A. Hale, USAF (5005 23rd St. S., Arlington, Va.), "I have on hand information pertaining to all classes of racing craft, both inboard and outboard.

"In building model boats I have found it most worthwhile to follow closely the designs of craft in actual use. At present I am working on plans of a model similar to the Unlimited, or Gold Cup, Class hydroplane."

Major Hale's Gold Cup model is shown above and below. It is designed at 1-in-to-foot scale. Two other Hale models are on opposite page; bottom drawing is 1-inch-to-foot model of 48 cubic inch hydro.

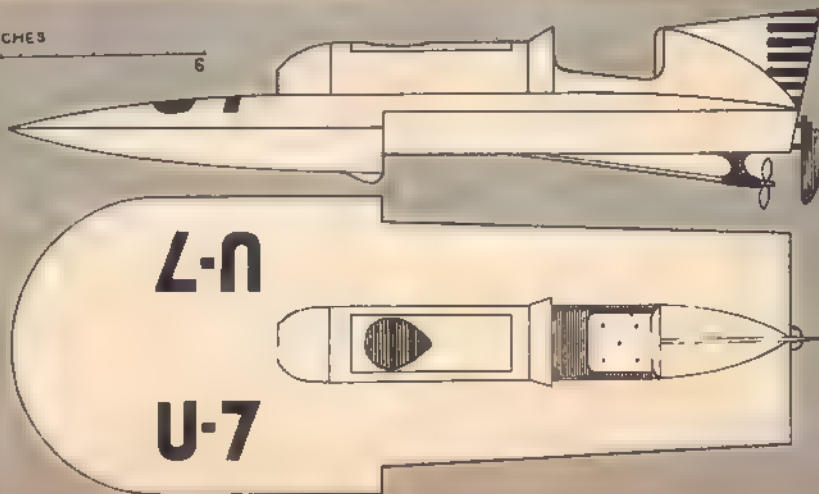
Speed race results this issue come from two sources. From headquarters of International Model Power Boat Assoc. we have the speeds made at the Detroit Model Power Boat Club, Belle Isle Park: Open Class—1—Charles Baxmann, 69.76 mph; 2—E.W. Chiavarini, 69.23; 3—Robert Colson, 65.47. Class F—1—Billy Baxmann, 58.82; 2—Rickey Baxmann, 55.38; 3 — Robert Colson, 54.87.

Results of the Speed boat events at the 2nd Annual Hydro Meet held by the Bristol Aeromodelers at Bristol, Pa. were received from Bob Graham, and we find that Max Biederman of New York was top placer in Class A with 65.21 mph. Max also won Class B with 72 mph, while Fred Manderville (also of New York) came second with 62.50. Philadelphia's Walt MacWilliams topped Class C at 71.42 mph, Bob was next at 69.76, while in third place we find Fred Manderville with 48.91. In Class D—Ray Seavey (Phila., Pa) 72.58; 2—Max Biederman, 71.42; 3—Bob Graham. Bob also took Class E with 74.38, Manderville was second and Ralph Richards of Philly came third. Bob Graham topped Class F, followed by Larry Richards. Prizes went to three highest speeds regardless of class, so Graham, Seavey and Biederman were the winners; however Larry Richards got a prize for his 56.60 mph in Class F. Bob also mentions that his twelve year old son, Thomas, took second in the Across-the-Lake outboard race.

Recovering somewhat from the Catalina race mentioned here last issue, Bill Baughman (5738 Dane Ave., Los

INCHES

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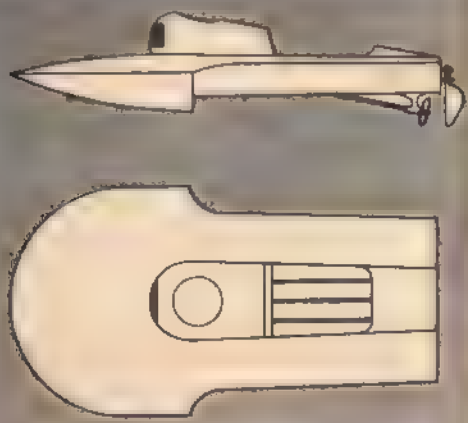




Angeles 43, Calif.) took in a bit of the model aviation Nationals, and has been running some boats that had been sitting around the house gathering dust. These were apparently non-radio boats, for Bill mentions that the weeds in Alondra were all down at the end of the lake where the R/C boys operate. He notes that attendance at lakeside was very poor, with only about a dozen modelers spotted along the shore; weeds and vacations probably accounted for the poor showing. Bill is getting interested in the possibility of sending an R/C boat from the mainland to Catalina Island; he recalls that R. L. Brown did quite a lot of work on such a project last summer, but never actually made an attempt, and since then Brownie has dropped from sight completely—no one having seen him around L. A. in months. Bill has a full-size boat, so could follow the model across the 25 mile stretch of water. He has been attempting to stir up interest for the run among local R/C men.

A new event to try at R/C boat meets is Docking. Just as it implies, you try to maneuver your pride and joy into a scale-size dock, without crashing into the sides, scraping paint, etc. We understand the English modelers are attempting this event; idea is to approach the dock, ease the ship in, pull out ahead and turn around, then back the boat into the same dock, and lastly, back out and get under way again. Sounds like a real test of steering and engine controls, and we wonder if anyone over here has tried anything like this. We'd like to hear of results, how the event was scored, etc.

Some nice boat pix received from Wallace Knopp (60 Pinewood Gardens, Hartdale, N. Y.) which we hope to have in a later issue. Mr. Knopp gives a few details of an R/C yacht he made from a Sterling "Monterey" kit; this is a 21" (Continued on page 64)



INCHES

0

If You want the Best....you want

Two Fine New Operating Boat Kits

"Barracuda" Runabout WITH THE **PRE-SHAPED WOOD HULL**

A thrill to build a thrill to own. The Barracuda beats all models in performance, ruggedness and simplicity of construction. Completely prefabricated in typical IDEAL style with our exclusive PRE-SHAPED WOOD HULL, mahogany deck and ALL fittings. For eye appeal, performance, ease of assembly and outstanding value, nothing compares with the Barracuda.

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Length 15½" Beam 5½"

IDEAL MODELS

BRAND NEW!

PACKED WITH NEW POWER! SPARKLING WITH NEW BEAUTY!

\$2.50 WITHOUT MOTOR

RICHARDSON Sedan Cruiser WITH THE **WELDED WOOD HULL**

This fast, seaworthy cruiser has been reproduced exactly from hull to cabin. It features our exclusive WELDED WOOD HULL, die cut mahogany parts, beautifully detailed metal fittings, simplified picture plan, top performance, quality throughout. That is why more model builders ask for and buy IDEAL MODELS.

For INBOARD or OUTBOARD MOTORS

Ideal for RADIO-CONTROL

Length 23" Beam 7½"

\$8.95 WITHOUT MOTOR

See our line of Operating Boats at your dealer

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GOOD NEWS

TELECOMMANDER

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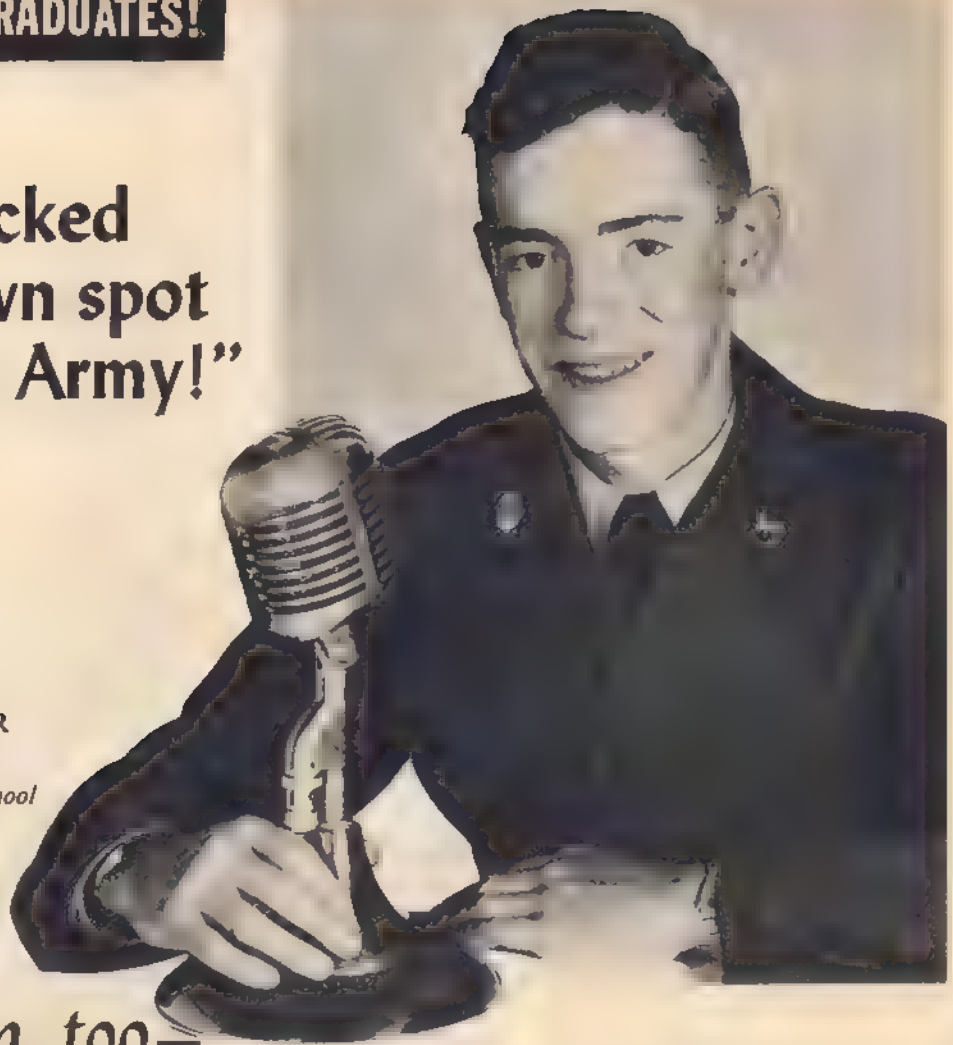
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Speaking of HOBBIES

AND HERE WE ARE!

New name and all. Have any difficulty locating us on your newsstand? Bet you didn't—not with that hobby shop cover! Please don't write us about that Super Duper .29 engine. As far as we are concerned it's a myth. (Hey, mister, what makes my engine keep mything?)

How about that "wingless airship" (as the newspapers called it) shown there? Charles Pritchard, a railroad gang foreman from Emporia, Va., designed and built it. Was he inspired by Roy L. Clough's "Martian Space Ship" which appeared as a wingless model flying project in our April 1954 issue? Quite a few miniature wingless wonders have put in appearances across the country (see "Everything Under Control?" and "Hobby Model World" this issue for several examples). About Mr. Pritchard's job we have as yet no flight reports.

Love that cartoon! Navy officer growls: "All I know is that an SOS was sent out from this location."

Musician-mad-about-models is about the way you could describe North Hollywood's David Rose, well known composer and conductor. Just look at the collection of steam engines he has in his home workshop-museum. That miniature GNR Sterling Single engine is the English version of this country's Diamond Stack used in service in 1849. DR is both a stationary engine and model railroad fan; he operates a man-carrying live steamer around the grounds of his home.

We want you to remember all our special competitions and photo awards that appear in every issue. For instance, in the boat, plane and car design competitions (each is a separate event) a total of \$225 is awarded every month for outstanding entries. Then there are the hobby club emblems—we pay \$10 for each one used. "My Favorite Model" attracts a lot of entries—how about it, have you entered yet? A \$25 award goes to each one we use! Also there's "Trick Stuff" which brings another \$25 per feat. And "What's Your Hobby?"—on this one we pay \$25 for first photo used and \$5 for additional pictures. By all means don't overlook such opportunities as "Most Realistic Model" (\$25 monthly award), "Hobbies-In-Action" (\$25).

In addition to all this, the "Hobby Model Sketchbook" pays \$10 for each item sketched. If you've developed something new in construction, control, operation or finishing of model craft, make a rough sketch and shoot it in to that department. And we pay from \$10 to \$25 for those schematics, ideas and gadgets that we illustrate in "Everything Under Control?", "Model Boating" and "Model Car News" sections. Above all, don't overlook our standard payment for photos: \$10 per shot to amateurs!—Al Lewis.

Our 100th Year—Established 1855

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Special YOUNG MEN Survey
For High School Students



IS THIS YOUR LINE?

The Magic World of Electronics

By DON DOWNIE

**A 'most' in help wanted ads is the electronics engineer.
Read how and why to prepare for this career now.**

■ This year, next year and through the foreseeable future, there will continue to be a shortage of trained engineers in electronics.

The future looks rosy for any graduate in the field of electronics—and it is. Electronics is that branch of electrical engineering which deals with the characteristics, properties and use of electrons, especially in vacuum or gas filled tubes.

However, electronic engineers are made, not born, and the decision to go into this relatively profitable and interesting field should be made at the age level where usually a high school student is far more interested in who will win next weekend's football game than the long-range approach of what he is going to tackle for a life-long vocation.

It takes mathematics and physics, and lots of it, to graduate in electrical engineering. Even now, most universities do not have graduate degrees in electronics. Most electronic engineers graduate in electrical engineering or physics with a communications option (major).

For concrete proof of the opportunities that exist in electronics today, pick up any big city Sunday newspaper and look under "help wanted." Column upon column of high priced classified ads cry

"Graduating Engineers! The future you've planned is possible at . . ." "A new role for the electronic engineer—pioneering in automatic controls." "Electronics Engineers. Career opportunities in research and development. We are doubling our floor area at our present site—another step in our growth program."

Including the cost of advertising, trade show participation in recruiting activities, transportation for interviews and the cost of moving families from one area to another, one company in the field, Hycon Mfg. Company of Pasadena, Calif., estimates that it costs over \$1300 to hire one good electronics engineer.

If the forecasts of leaders in the electronics and financial fields are to be relied upon, this shortage of engineers will continue for many years to come. "There is an almost insatiable appetite for engineers in the electronics industry for it is their creative genius that opens the door to electronic miracles of today and tomorrow," says H. Leslie Hoffman, President of Hoffman Electronics Corp. of Los Angeles, Calif. "Both airframe and electronics manufacturers expect to almost double their present staffs of electronic engineers by 1959. Technical graduates of recognized colleges and uni-

versities are able to be highly selective in the jobs they accept because of the great demand for their services."

Financial analyst David L. Babson says, "Electronics and its associated fields may show the greatest growth of any major technology in the next decade." He states that in 1949 the electronics industry produced about \$500,000,000 in gross products. In a short five years, the total was multiplied by 18 with a gross business of \$8,800,000,000. In 1954 the vast motor vehicle industry produced \$11,000,000,000 and the steel industry output was ten billions of dollars.

Babson projects an electronic industry volume of around twenty billions by 1970. In comment on this forecast, Dr. Allen B. DuMont, President of the laboratories that bear his name, said, "I don't see any reason why that figure won't be equalled or exceeded as electronics moves further into every concept of living."

If this electronics industry is such a good deal, you might well ask why there aren't more people in it. The answer is just as simple. It takes time; time and a lot of hard study to make an electronics engineer. Students who appreciate the future of electronics, unfortunately, must make up their minds long before the conclusion of high school that they want to join this mushrooming industry. A significant reason for the current shortage of trained electronic engineers today can be found in the statistics that show the proportion of high school students studying algebra has dropped from 50% to 20% in the past 50 years, and those studying physics has dropped from 20% to 4%. The Massachusetts Institute of Technology estimates that one out of four of its freshman engineering students is poorly prepared.

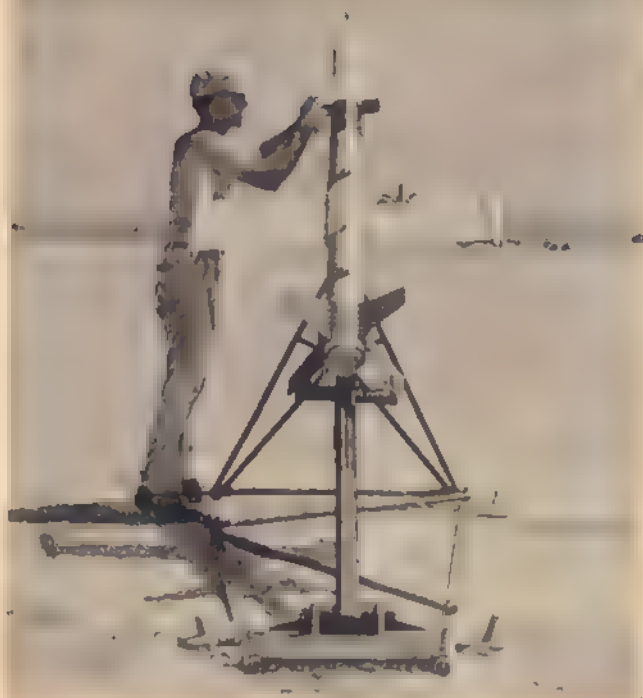
Three top colleges in Southern California, the California Institute of Technology, U.S.C. and U.C.L.A. have each shown a drop in graduates and advanced degrees in engineering and scientific specialists between 1952 and 1954. In 1952 CalTech graduated 350; two years later the total was 287. U.S.C. totaled 403 in 1952 and 375 in 1954 while U.C.L.A. graduated 1083 in 1952 and only 1040 two years later. During the same period Los Angeles County, in which all three schools are located, had an electronics industry which grew from a capitaliza-



The gentleman with crew cut on left-hand page is a Missile Systems Division engineer demonstrating missile model at Lockheed. In photo just above, large radar dome under nose of this boat-carrying B-17 Search and Rescue plane stationed at Hickam Field

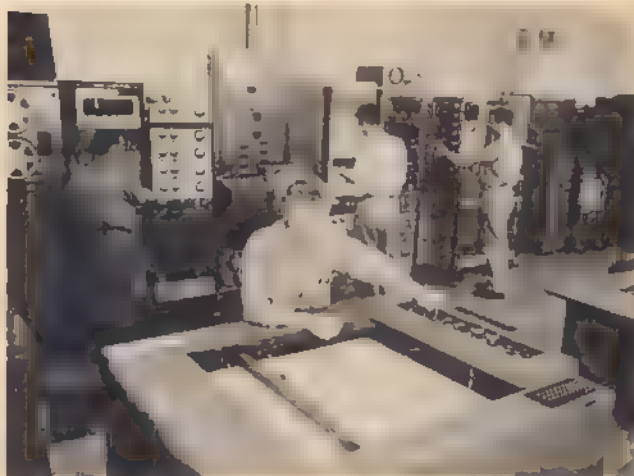


In Honolulu suggests great amount of airborne electronic gear such craft require. (There's even a new word—"avionics". Figure it out.) Photo at right, above, gives idea of complexity of testing equipment for missiles. (Hycon Mfg. Co., Pasadena, Calif.)



Electronic instruments in this rocket-driven device (left) radio back to ground behavior of scale-model wing designs at speeds about twice supersonic. Used by Lockheed in "tomorrow's design."

Below: Again at Lockheed's Missile Systems Division, at the Van Nuys (Calif.) plant, we see engineers working with electronic data reduction equipment.



tion of just over four million to well past 26 millions of dollars.

The road toward electronic engineering is no cinch. It involves one of the toughest courses one can take in both high school and college. It's loaded with mathematics; algebra, plain geometry, trigonometry and college algebra in high school if it is taught there.

"Of all engineering branches, the electrical (electronics) probably makes the most sustained use of higher forms of mathematics," says the Engineers Council for Professional Development.

In addition to mathematics, high school courses in physics and chemistry are a must. "The importance of physics in our national life increases daily," says Dr. W. C. Kelly of the University of Pittsburgh, "but the interest of high school pupils in the subject, as judged by the enrollment, drops toward the vanishing point. Physics has completely changed our pattern of national defense, created whole new industries, explored nebulae and probed nuclei . . . yet in 1948 less than 6% of our high school pupils were engaged in the study of this truly basic science.

"Physics is regarded as impossibly difficult," continues Dr. Kelly. "We must convince our pupils that anyone of moderate ability who has studied algebra and plane geometry can master a high school course in physics."

Surprisingly, courses in English composition are important to the up-and-coming electronics engineer. A large eastern firm established in 1918 has over 20% of its 5,000 employees as electronics engineers. Their junior engineers come from 34 different colleges and the biggest single complaint is the inability of the young engineers to write an adequate report. Laboratory reports in research and development projects require concise writing, and project engineers must frequently prepare status reports, bid descriptions and technical correspondence. This company strongly suggests that more time be devoted to English, specifically English literature, and

the humanities in general. Cal Tech, for instance, now devotes 25% of its undergraduate time to the humanities.

What kind of a guy will make a good electronics engineer? William McFadden, Chief Engineer of Hycon Mfg. Company in Pasadena, puts it this way: "He needs to have a bump of curiosity a mile high. He's the kind of a guy who wants to know the 'why and how' of things. His Dad was usually fixing things around the house and Junior wanted to know what happened. He grew up with an Erector set, a chemistry set or a crystal set that developed into novice 'ham' radio. To become really good, he must know about people as well as things."

There are very few positions open in the field of electronics for the non-college graduate. Varian Associates of Palo Alto, Calif., make a variety of complicated electronic equipment. Personnel Director Jim Armitage lists the educational and experience background for their technical employees in this order, from the bottom up. A general technician needs a high school diploma, at least five years' experience in constructing advanced technical equipment and considerable amateur radio background. The general technician's job is to design or modify electronic equipment such as power supplies and amplifiers, working from extremely sketchy information. Next step up the job classification at Varian Associates is the position of Junior Engineer. He needs a B.S. Degree (4 years of college) in Physics or Electrical Engineering and can begin his work without previous industrial experience. The Junior or First Level Engineer carries out basic engineering research and development assignments under close supervision of a Senior Engineer.

A Second Level Engineer at Varian Associates needs a B.S. degree and at least 4 years' industrial experience or a M.S. or Ph.D. (1 to 3 years of graduate work) and no industrial experience. He must be able to design, with very little

supervision, electronic or nuclear equipment.

The top, or Third Level Engineers at Varian Associates have a B.S. Degree and 8 to 10 years of industrial experience or a Master's or Doctor's degree and 4 to 8 years of experience. Their duties are to perform the highest type of creative or independent engineering and act as project engineer on the most complicated projects.

A more graphic demonstration of the importance of a college degree can be seen where it hurts—in the pocketbook. A survey conducted within the year by the West Coast Electronic Manufacturers Assn. shows that graduate electronic engineers with four years' experience averaged from \$450 to \$600 per month. After ten years, their pay was usually between \$600 and \$750, and after twenty years they earned from \$775 to \$950. Non-graduates doing basically the same type of work averaged from \$425 to \$500 after four years, from \$450 to \$550 after ten years, and, after twenty years from \$500 to above \$800 in a few cases. In all classifications of 1024 engineers questioned, graduates were making substantially more money than non-graduates.

However, there's a lot more to entice young men into the field of electronics than just a good salary and plenty of job opportunities. Specialists in Industrial Relations point out that the feeling of doing an important job and doing it well in the eyes of the community and the nation is always more important than the money involved. In a world divided into two ideologies, what work can be more important than the products of a creative mind in the field of electronics? Secretary of the Air Force Donald Quarles calls the current engineer shortage "potentially a greater threat to national security than any aggressor weapons known."

While less than 20,000 accredited engineers received diplomas from schools in this country last year, Russia graduated an estimated 53,000 engineers.

"At the present time, the Government

provides the largest markets in the electronics industry," says H. Leslie Hoffman. "Production for the military services includes guided missiles, radar of various types, communications equipment and electronic control equipment for guns, tanks, ships and airplanes—in fact, any type of equipment that will detect, measure, analyze, compute, store, control or convey information or intelligence. The battle for superior weapons has become a battle in electronics."

The field of military electronics is virtually boundless, though most of it carries a "top secret" classification. A guided missile, for instance, is divided into three parts: the brain, the flame and the frame. The brain is completely electronic while most of the research and development of the frame and the flame is carried on with electronic recorders furnishing data to be evaluated by electronic computers. The word "avionics" has been coined to cover the completely new field of airborne electronic equipment.

Important as it must be, the field of military electronics can well be overshadowed by rapid advancements in automation, the science by which machines and tools can be made to do even more of the work now performed by human beings. The petroleum industry has long been a leading example in automation where electronic and pneumatic devices regulate the entire processing operation.

Today electronic computers can solve in a few hours a complicated actuarial problem affecting millions of insurance policyholders. They can handle payroll accounts, complete with paychecks (deductions noted) for thousands of employees. These "giant brain" processing data machines have cut thousands of hours of scientific calculation time from important research projects.

Leaders in the electronics industry, all down-to-earth business men, foresee automatic warehouses, factories and retail stores as the rule rather than the exception. Counters used in conjunction

with computers may be expected to route the flow of automobile and truck traffic in and out of our larger cities just as radar systems and computers now control air traffic around busy airports. Proposals have already been made that would control the speed and separation of autos on the highway, allowing the passengers complete relaxation while traveling with much greater safety than at present.

In speaking of the future of electronics, A. M. Zarem of the Stanford Research Institute comes up with this thought: "Consider solar energy, perhaps our most precious unused natural resource. Coal and oil once used are gone forever. But the energy we receive from the sun comes to us daily and is continually replenished with no effort on our part. In a single day $1\frac{1}{2}$ square miles of the earth's surface receive enough energy from the sun to equal that of one Hiroshima-type bomb. In the United States alone, the energy daily obtained from the sun is 2,000 times the nation's total requirements for energy in all forms. It is safe to predict that electronic devices of conventional types and of types as yet unimagined will play a dominant role . . . for effectively collecting and utilizing this vast untapped potential."

Sounds like an up-and-coming industry, doesn't it? So how do you go about getting aboard? Like anything else that is worth having, it's going to be work—and a lot of it—but the odds are greatly in your favor if you are in the top half of your high school class and find mathematics no serious problem. To get ahead in this field, college is a must, as we pointed out. If a student's parents can afford to send him to four years of college, that's swell. If not, there are many scholarships and part scholarships to be had.

"It costs roughly \$1800 per year to send an undergraduate through an engineering course," estimates Louis W. Jones, Dean of Admissions at Cal Tech.

"This figure includes \$750 in tuition, room and board, books, lab fees and reasonable entertainment — everything but transportation. And that's a bargain in education because it costs us \$1800 for each student on campus. Grants and donations make up the difference between our tuition and our costs."

A recent survey by the Engineers Council for Professional Development shows that there are over 2800 scholarships in colleges for engineering students. These average about \$200 a year each but individual grants may go as high as \$700. Fellowships (scholarships for engineering graduates) in post graduate work average over \$700 and may run as high as \$2,000.

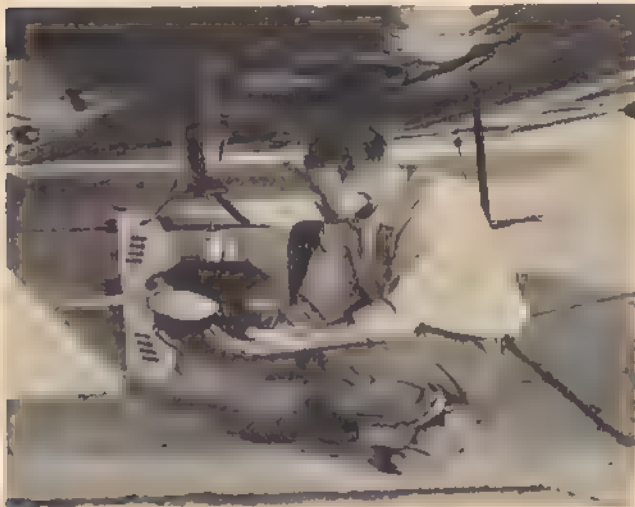
"The best way to get a college scholarship," according to Dean Jones of Cal Tech, "is to write directly to your favorite college for their entrance catalogue and read it. Then apply in writing for both admission and a scholarship."

Over 100 of the more prominent colleges throughout the country are now using a standardized form issued by the College Scholarship Service (Box 176 Princeton, N. J. or Box 27896 Los Angeles, Calif.). After scholarship requests are filled out by the high school student's parents, they are forwarded by this service to any of the member schools at the request of the student or his parents. A complete photostat to each school is \$1.00 per copy.

Many of the top colleges are linked together with the College Entrance Examination Board with Headquarters in Princeton, N. J. This organization gives standardized aptitude and achievement tests in schools all over the country and the results are used by the member colleges as a yardstick by which to measure freshman applicants.

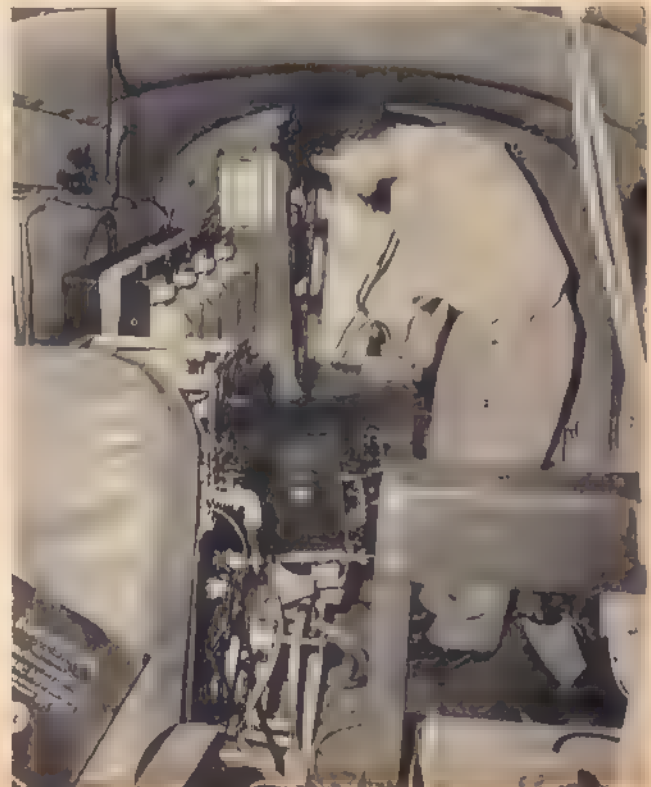
As a result of good grades in high school and top marks in these standardized examinations, "honors at entrance" awards are made to students who can afford to pay their way through college.

(Continued from page 63)

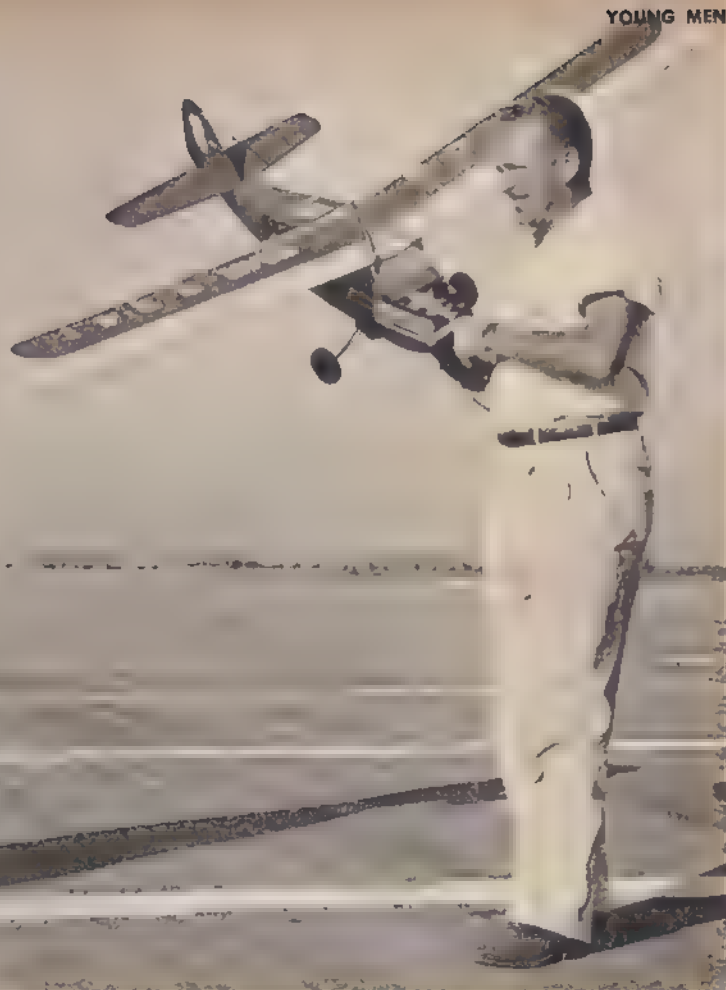


Today's booming search for uranium and many needed minerals is much aided by electronics. Airborne magnetometer being attached above, records rock formations below earth's surface.

Aerial surveys also make use of the electronic scintillator like this experimental 3-channel job being installed in Twin Beechcraft (left). Scintillators are like super-sensitive Geiger counters.



PHOTOGRAPHY & MODELS



Various "shooting" techniques as demonstrated by Mirror Model Flying Fair contestants, officials and spectators. Note "up-right" school in action, the "lean-into-it" exponent. Bob Hatchesek shows forehead position; Bill Johnke in white helmet.



Shutter Fans Outnumber Entrants at Big Meets

■ How can you make a statement like that? It's all quite simple. Ever been to a big model contest? Doesn't matter whether it's a gathering of plane fans, or boatmen or race car enthusiasts. Almost every contestant has a camera and while he's competin' instead of clickin', there seem to be at least six spectator cameras turned on every model.

With all this exposure of multitudinous rolls of film you'd almost think that some tremendous number of fine photographs would result. Truth of the matter is that precious few good pictures emerge from the darkroom. Why should this sad condition exist, and we mean all over?



YM's own photog. John Schneider of East Meadow, N.Y., at the National model plane meet. He gets down to cases and specifically John Tatone's fabulous Meyers "145."



A mighty big model gets the treatment from a pretty small photographer with an undersized camera. Jerry Wheeler, 7, uses 16-mm camera on Black Widow by A. W. Kleinhans.



Now, all together, men, one-two-three. Ralph Saldivar of Fresno, Calif., turned out this magnificent Starfire, which brought the model photo bugs buzzin' around like bees in a field of clover.

As a politician says when he isn't sure of his answer, "That's a good question!" After pondering over this for many an issue and after sighing over many a disappointing print of an obviously magnificent model plane, car or boat, the editors of this magazine have come to the reluctant conclusion that the general public and Johnny Modeler photograph model subjects with about the same success they have snapping Aunt Matilda.

So what to do? Well, we'll just keep a-sittin' and a-hopin'. Whenever you hear a happy shout from the editorial offices you'll know a good model photograph has come our way.



Shot of radio controlled model truck made by Linda Sinclair who covered 1955 National Championship Model Airplane Contest for "YM". More of her pictures will appear in an early issue.



Here's a neat trick for movie fans. Dwight Hartman, Argentes, Ill., took two small cases, cut off bottom of each, fastened them together. Film stored in lids under masonite dividers.



Chris Sublett, Quincy, Wash., shoots internationally famous Joe Bilgri with tiny 16-mm still camera. Joe, member of the Oakland Cloud Dusters' club, has been on many U.S.A. teams.



Miss Sinclair in action using flash attachment on box camera. Betsy Schrang of Matanzas, Cuba, poses with brother Harry's truck. It has forward, stop, back, left and right control.

YMCA Youth Director Designs Scale-like Stunter!

Our nomination for best looking control line stunt plane goes to this F-86-like entry which represents many years of designing and flying experience by noted Ohio youth leader. Stop, look and let's go!

Wicked Witch

By
DONALD L. HOAG



■ The beginnings of the *Wicked Witch* go back to 1951. In the four years that have elapsed since then there have been no less than seven related designs built and tested. A great deal of time was put into the ideas incorporated in the *Witch*, and credit must be given to all the other fellows whose magazine articles and designs have borne some influence on not only this model but on practically all the present day stunters. Particular credit, I believe, should go to Bob Palmer who has done much to put the finesse in current stunt design. There are in the *Wicked Witch*, however, some rather unique combinations of other men's ideas, plus one or two of my own original concoctions.

The goal foremost in my mind has been to work out a top-notch stunter that looks like a real airplane. This has been the goal of many others, of course, but somehow the present designs have never satisfied my idea of a realistic stunter. With the F-86D Sabre as my evolved choice, there are features which are not and cannot follow scale and still produce a red-hot stunt plane. The wing configuration is an example of this. However, it seems to me in the light of the avowed function of the *Wicked Witch*, a more authentic appearance is presented in this plane than is the case with most other stunt planes today.

A last word regarding authenticity: the *Wicked Witch* is red and does not sport the aluminum finish ordinarily to be expected. The latter was tried but discarded because it simply did not give a realistic finish. Actually, we based our use of color on a color photograph we saw of an experimental F-86D. This plane was painted bright red and had a black radar nose.

Performance and Specifications: The *Wicked Witch* is an extremely stable, smooth flying stunter, easily capable of the pattern and having good wind penetration. The span is 56 in., length 33 in., weight 47 oz. It is powered by a Fox .35 swinging a 10/6 prop.

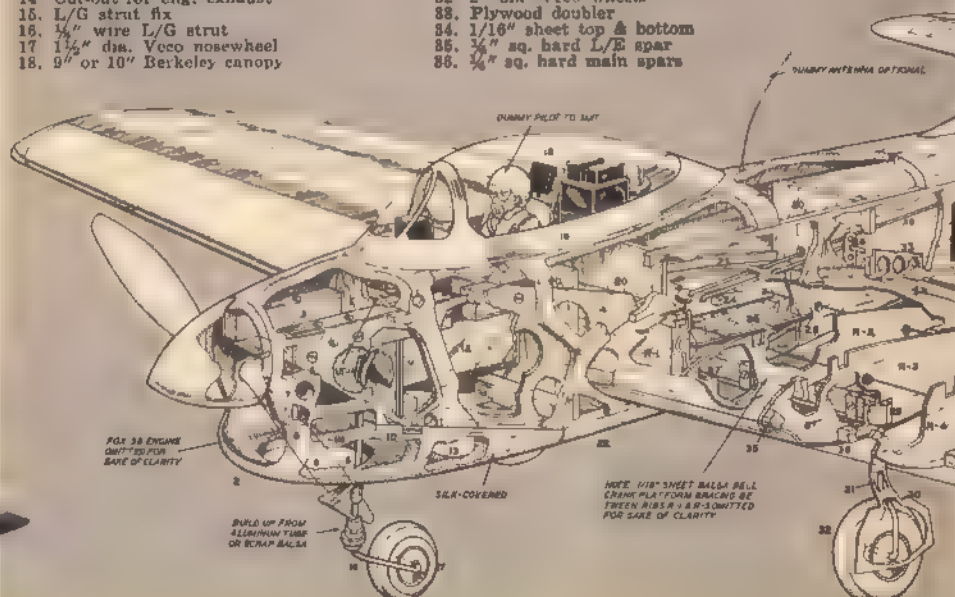
The landings are a phase of flight which is somewhat tricky until one gets the knack. This knack consists of landing the plane at a fast clip. The design of the landing gears permits this fast landing and makes bounceless landings consistently possible.

Although the plane is on the comparatively heavy side, its size as far as wing area is concerned offsets this weight so that performance is really amazing. There have been some who wondered at such a small powerplant in such a big airplane. The Fox .35 is ample power! We are at present experimenting with a high-compression head on the motor in the plane and find that by comparison there is a slight edge in favor of the new head. The speed of the plane is rather startling in view of the size and weight, and we have been judged approximately 60 mph plus on 65 foot lines of .012 diameter. This is plenty for stunt performance.

In view of the triangle added to the stunt pattern this year, it will probably be advisable to keep the weight of the model as low as possible. However, this ought not be difficult because the original has several coats of aluminum dope below the present exterior finish of red. In short there is more dope on the original than there need be, and the reason, which was a misfortune, has been given.

Design Notes: The plane was designed to be very rugged and at the same time

1. 2" Spinner
2. Removable cowl
3. Hardwood engine bearers
4. Plywood motor mount doubler
5. Plywood firewall
6. This screw set below center
7. Hole for needle valve arm
8. Key peg
9. Hole for cyl. head clearance
10. Plywood cross-member
11. Holes for tank fill & vent
12. Froom baffle tank
13. Cooling hole in bottom of cowl
14. Cut-out for eng. exhaust
15. L/G strut fix
16. 1/4" wire L/G strut
17. 1 1/2" dia. Veco nosewheel
18. 9" or 10" Berkeley canopy
19. Masking tape canopy trim
20. 1/4" sheet formers
21. 1/4" sheet sides
22. 1/4" sheet bottom hollowed out
23. 3/16" sheet reinf.
24. 3" Veco bellcrank
25. Plywood bellcrank platform
26. Flap horn
27. Plywood main L/G spar
28. L/G strut extens. to B/C platform
29. L/G spar reinf.
30. Tin wheel covers
31. 3/32" dia. wire L/G strut
32. 2" dia. Veco wheels
33. Plywood doubler
34. 1/16" sheet top & bottom
35. 1/4" sq. hard L/E spar
36. 1/4" sq. hard main spars



do any stunt in the book.

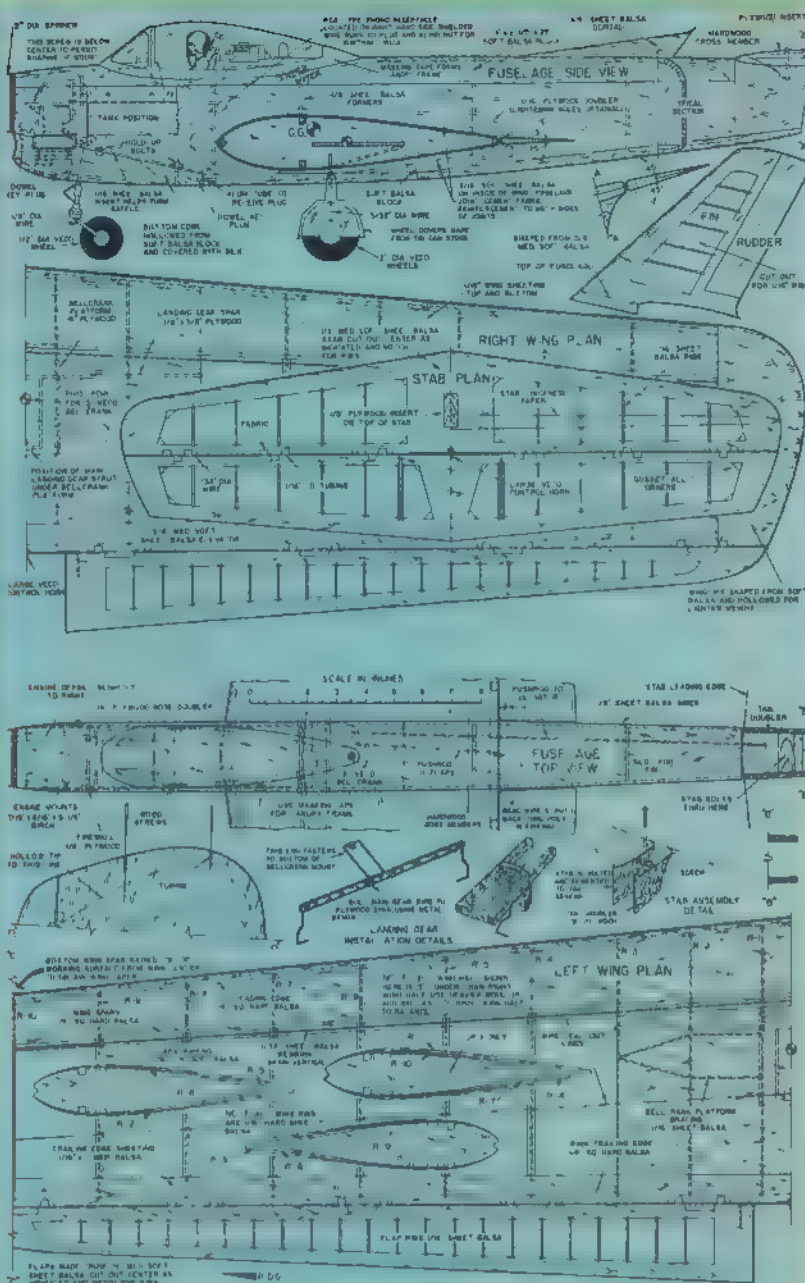
Some of the points on a model where construction breaks down are the engine mounts, landing gear, and the joints where the wings and tail planes join the fuselage. All these points are specially designed on the *Wicked Witch* with the exception of the wing-to-fuselage joint which is braced and "gauzed" conventionally.

The body lends itself to heavier construction because the stab extends beyond the aft end of the fuselage making possible an inherently smaller and lighter fuselage which allows for weight added for the sake of strength. This is partly what helped determine the choice of the F-86D as the airplane to model.

The motor mount is a built-up box consisting of 1/16" plywood doublers, birch mounts, the 1/8" plywood firewall and birch cross-members. These items are all pre-glued, glued and screwed together. The bearers themselves are separated by a distance too small to allow the Fox .35 crankcase to fit between them. Therefore, they must be tapered. This system allows for the motor bolts to pass through bearers closer to their vertical center, thus providing a solid mount for the motor and making less likely the chance of the bearers splitting in case of untoward happening. This narrow arrangement of the bearers makes necessary an adjustment regarding the Froom baffle tank used.

This adjustment is made simply by tapping the wedge side of the tank into a flattened or rounded surface which narrows the tank and allows it to fit between the doublers. The tank should be checked for leaks, re-soldered if necessary, then installed. I have never had trouble with a dirty tank which required

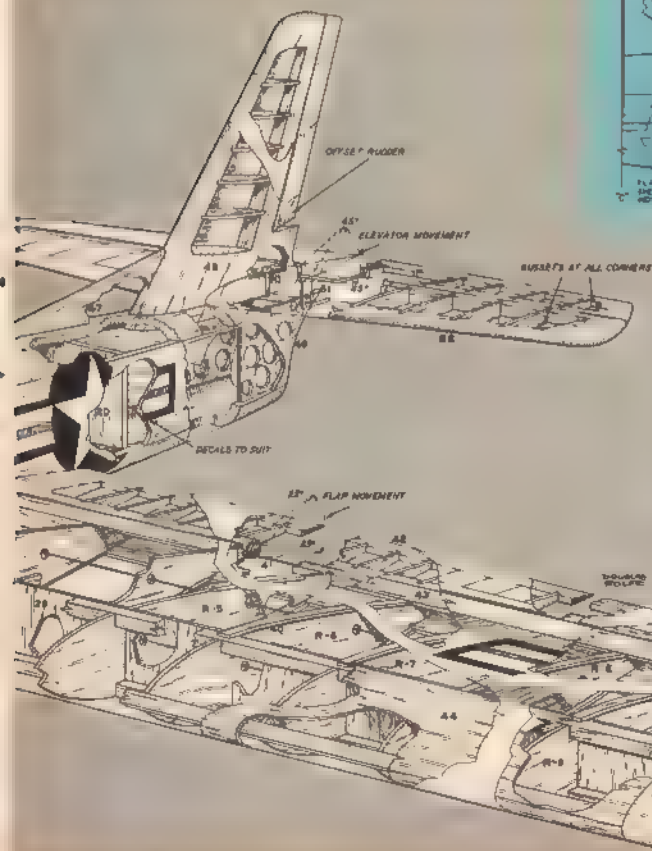
(Continued from page 89)



Full-size plans for *Wicked Witch* are part of Group Plan #1155 by Hobby Helpers, 770 Hunts Point Ave., New York 59, N. Y. (50c).

- 3 1/16" hard sheet ribs
- 38 Pushrod to elevator
- 39 1/32" sheet webbing
- 40 1/16" x 1/4" cap strips
- 41 Flap hinge rod
- 42 Flap ribs 1/16" sheet
- 43 T/E sheeting top & bottom
- 44 L/E sheeting top & bottom
- 45 Soft balsa tips hollowed out
- 46 Lead-out guide tube
- 47 1/4" sheet dorsal fin
- 48 3/4" sheet fin, 1/16" sheet ribs
- 49 Plywood doublers
- 50 Plywood insert
- 51 Elevator horn
- 52 1/2" sheet stab, 1/16" sheet ribs

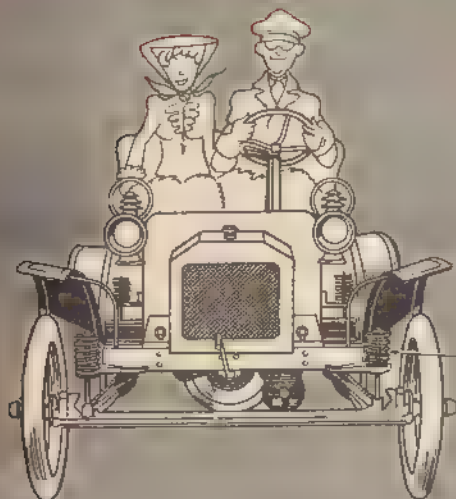
NOTE: THIS WING HAS EXTRA RIBS 1/2" LONGER THAN OTHER WINGS



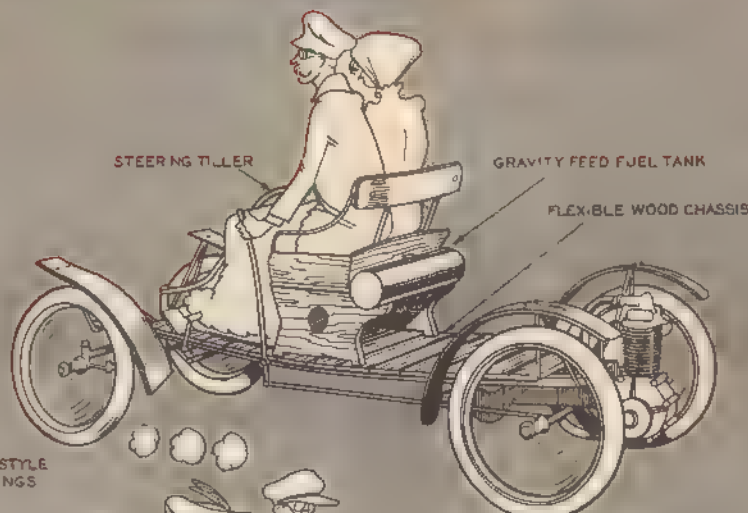
AUTO Progress

By DOUGLAS ROLFE

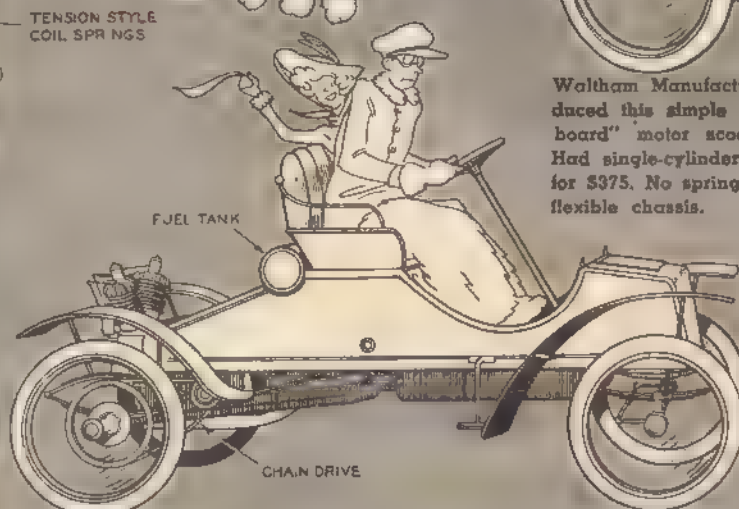
The Light Car in America 1903-1937



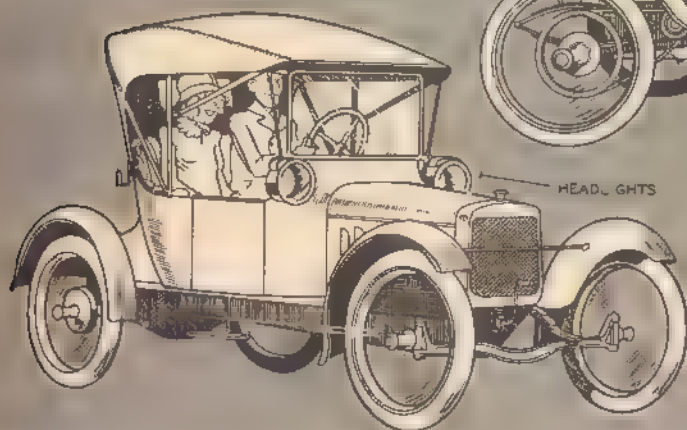
This 1907 runabout was product of A. P. Brush, noted designer of first one-cylinder Cadillac engine. Coil spring suspension, engine under hood, wheel steering—all advanced design features.



Waltham Manufacturing Co. produced this simple "Orient Buckboard" motor scooter in 1903. Had single-cylinder engine, sold for \$375. No springs beyond the flexible chassis.

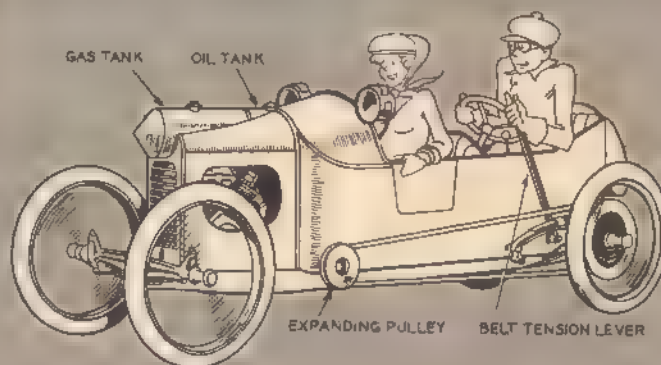


1907 Orient Runabout was considerable improvement over the original 1903 model. Rigid chassis with conventional springing and V-twin motorcycle engine. It sold for about \$600.



1914 model of Saxon Four (popular early U.S. light car, \$335) featured 18 hp L-head Continental, 8-ft. wheelbase, wire wheels.

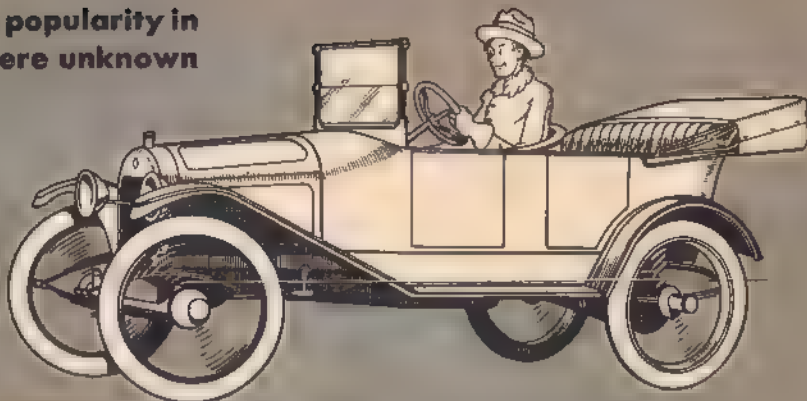
Somewhere around 1912 this imitation (right) of French "Bedelia" was produced here. It had V-twin motorcycle type engine with long vee-belt drive to rear wheels. Chief differences from French prototype: front axle springing, steering.



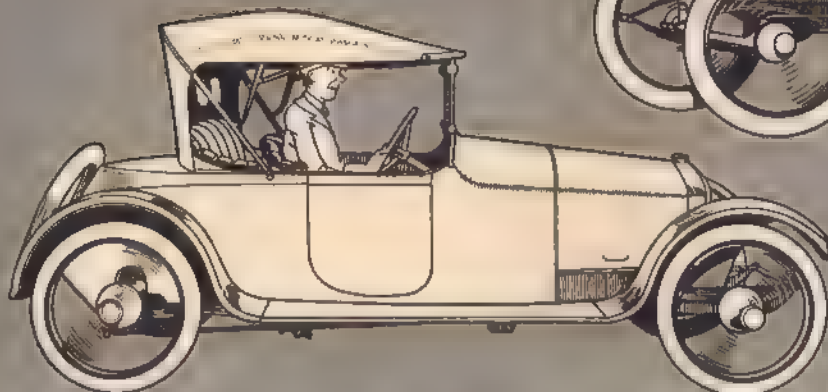
The light car movement which started about 1910 in Europe has never really caught on in the U.S., despite the increased use of small cars here since WWII. This typical American aversion to the light car, so well indicated over the years, has not daunted either domestic or foreign manufacturers from trying to sell such cars in this country, as witness the various makes shown on these pages. There

are many sound reasons why the small car has been slow in finding acceptance here and equally sound reasons for its early acceptance abroad. Fifty years ago the highways in Europe were generally far superior to those in the U.S., or at least were suitable for the operation of small cars, while the situation here was exactly the reverse. Then again we were not hampered by the paralyzing horsepower

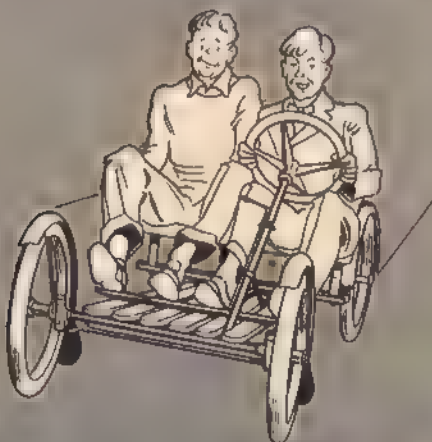
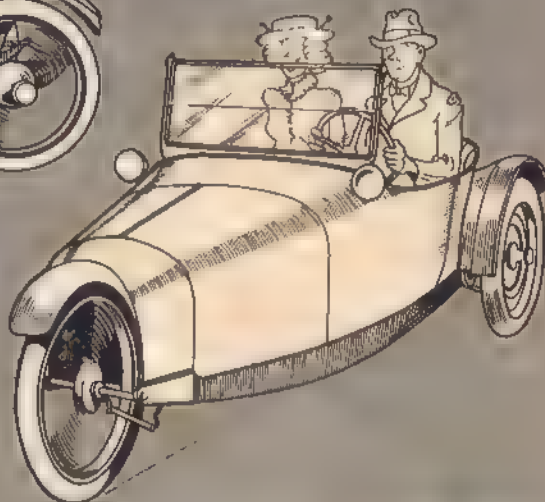
These welterweights enjoyed limited popularity in days when coast-to-coast car trips were unknown



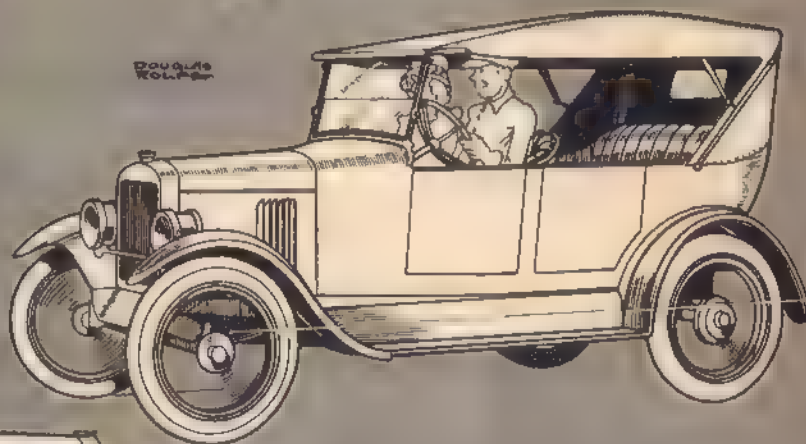
The Metz Co. turned out this light four in 1915. Wire wheels, full elliptical springs, electric headlights. Metz went out of business in 1921.



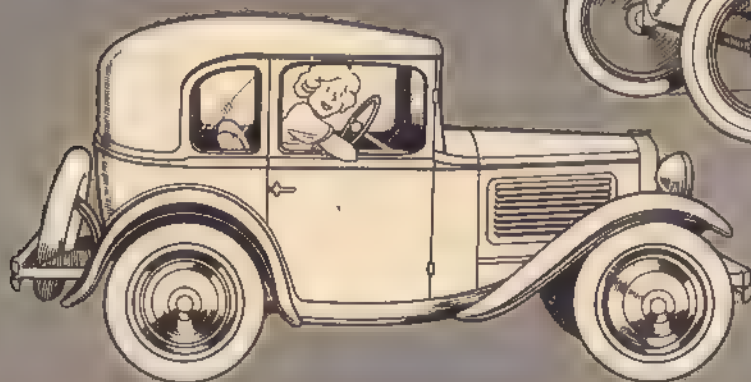
The 1915 Scripps-Booth was probably most popular U.S. light car in its day. This sporty little 3-seater had 4-cylinder overhead-valve engine; \$775.



Stark "Buckboard" enjoyed brief vogue around 1919. Fifth, motorized wheel in rear gave power. Duryea's 3-wheel light car of '09 (above, right) unsuccessful.



Priced at low \$490, little Gray was conventional but very light car. 25 hp, 4-cylinder engine noted for economy, and model sold well but company folded in 1926. Built by famed manufacturers of marine engines.



Pin-size American Austin (left) with a mere 75-in. wheelbase and only 13 horses was long popular—thanks to economy of operation, low price (\$425). Later renamed "Bantam."

tax and the almost prohibitive cost of gasoline which practically forced the light and ultra-light car on most motorists abroad. Today the picture is different. The entire nation is criss-crossed with a magnificent network of highways, parkways and freeways which make the light car feasible here, if only as a second car. Mounting taxation on almost everything, including the automobile, suggests

that within the next few years we may see a swing away from the present emphasis on size and horsepower and a gradual increase in the sales of light cars—particularly in the urban areas where the parking problem grows more serious as each day passes. Next installment will deal with U.S. light cars produced since the end of the period covered here.

■ Let us assume at the outset that you have been a serious model builder for several years, and the idea of opening a hobby shop has been in the back of your mind. You also have some money to invest or can borrow some from parents or friends. To bring the story closer to home let us also assume that working with your hobby from the hours of six to twelve each night and all day Saturdays and Sundays is not nearly enough for you. You have decided that by owning your own hobby shop you could then work at your hobby all day in addition to the usual evening and week-end hours.

If you are a serious builder and you think you will find time to model during store hours, forget the idea of owning your own shop. Your time would be taken up with selling merchandise, ordering stock, arranging stock, making displays, and looking through a variety of mail from wholesalers and manufacturers concerning new merchandise, as well as a host of other jobs. The most difficult thing for a serious model builder to learn is not to be partial to the kits or types of models he personally prefers. Strange as it may seem, there is more merchandise sold and more profit made from selling to the beginner and average modeller than there is in catering to the advanced or expert builder.

I mention money matters briefly elsewhere in this article. How much cash does it take to open a shop? It depends on whether you open a hobby department in a store that is now doing business or opening a store devoted exclusively to hobbies and crafts. There is a very common fallacy existing that you can open a hobby shop on a shoestring. Those that are opened in this manner are usually closed in short order.

Five hundred dollars will start a hobby department in an already existing store. Two thousand will start you in a separate store. Let me qualify this a little more. Notice I said, "will start you." Many people start shops in this manner but do not draw a salary for a long time. They pour back the profits into the business in order to build up an inventory. Usually the owner of a shop begun in this manner works elsewhere and hires someone to work in the store when he cannot be there. If he is married he has free help. (It will cost him anyhow.) He spends week-ends, holidays, and after work hours in the shop.

Not only must the inventory be built up but the merchandise must be sold and replenished during the year. We refer to this selling and restocking as turnover. Turnover is the number of times an item is bought and sold out in a certain period of time (usually a year). If \$5,000 worth of merchandise has a turnover rate of four, then your sales would be \$20,000, from which your profits after expenses would be about \$3,000.

For a hobby shop to be somewhat complete (and profitable) i.e., carrying trains, airplanes, motors, crafts, a minimum inventory should be \$10,000. For then, if you turn over this amount of merchandise four times in a year, sales would total \$40,000. Assuming your overhead expenses (rent, light, heat, advertising, salaries) stay the same or increase slightly, you could earn a profit of over \$7,000. Hence you can see the necessity of pouring back profits to build up an inventory and the need of selling more to increase turnover.

This brings us to one of the biggest gripes that you hear among the "experts" (look at yourself carefully), namely, "What kind of hobby shop is it that doesn't carry Brown Junior piston rings?" By way of explanation to the newer modelers, the Brown Junior (may she rest in peace) went off the market sometime in late 1942.

Some people immediately jump to the conclusion that the successful hobby shop should have a complete stock of all engine parts, kits, and accessories made in the last twenty-five years. Not only is it impossible to obtain this merchandise, but you wouldn't want it if you could. The sale of most of this old merchandise is very slow, so that stocking it would tie up money that would be better used buying the new merchandise and reduces the turnover rate, which means less profit.

"I am a model airplane builder and I just want to stock model airplanes (or trains) and accessories," you say. If you live in a fairly large town and you specialize in this manner you might be successful. It's the same old story of putting all your eggs in one basket. If the season on airplanes falls off, then you have nothing else on which to depend for sales. More power to the hobby shops which do specialize and realize a profit. They are becoming fewer in number all the time.

Last, but not least, how do you decide what kits to stock and where do you get them?

Almost all of the merchandise advertised in YOUNG MEN is carried in stock at most good hobby shops. This is the point at which the hobby wholesaler or jobber fits into the picture. The job of these men is to gather under one roof and to stock in quantity the many varieties of hobby merchandise needed by hobby dealers. You do not order merchandise for the store directly from the manufacturer (imagine ordering from 127 different manufacturers). This arrangement allows you to order the merchandise from one or two jobbers, saving both time and money. It really simplifies the job of ordering and keeping the proper merchandise in stock at all times.

The hobby jobber also serves another important capacity, that of adviser. He can tell you what to stock, how much, how to improve your business, etc., only if you are honest enough to tell him the true status of your affairs.

A book, "Hobby Shop for Fun and Fortune," has been published by the Model Industry Association, 82 West Washington Street, Chicago, Ill. The booklet is excellent for showing you the proper ways of operating a hobby shop successfully. I would also recommend membership in this organization if you do enter the business.

One last point worth mentioning is that while it is important to know something about hobbies in operating a hobby shop, it is more important to know good business procedure and to have business experience. While the hobby business differs somewhat from other types, it still is and must be run as a business if you want to be here for the countin' of the "green."

My advice at this point is that you see a competent psychiatrist (preferably a non-modeler).

For instance, repairing engines, trains and boats. Or firing ceramics. Or fighting off over-eager salesmen of all types and sizes. Or paying the bills.

Too many people live in the past in this respect. The "case histories" they enumerate are mostly of the 1935 to 1940 era, when a dollar bought much more in labor or material than it does today. Now it is mandatory to have sufficient capital to start "big" and to have enough set aside for an aggressive advertising campaign. If you start "small" nowadays, a person is apt to ask you for an item you don't have in stock—when he goes elsewhere to get it, you've failed to create traffic into your store—in fact, you are creating traffic for your competitor who has that item.

I would say \$800

You mean theoretically, don't you?

This is all conjecture or "average." You can't depend on these figures holding true if you are in an area where several shops were established before yours. Or if the others start a "price war" and slash you out of business.

The earlier Brown Juniors didn't have piston rings (you really have a problem there, Mr. Swack). And how about the "engine-boarders" who come in and in all seriousness ask for replacement parts for their Lourel, Hurleman, Tlush or "Tom Thumb" engines? Or the desperate-looking characters who haul in a mangled Chunn, James, M&M, Bat, Pee Wee, Condor, Copper King, Wensen, or Mite engine and won't believe you when you try to explain that parts never were available for these and other short-lived types.

Might is right. The day of the specialty shop is gone. Show me any successful hobby shop and I'll point out a side-line of cameras, toys, sporting goods, stamps, or some other allied line to even off the severe seasonal slumps that the "specialty shop" experiences. It is wise to add lines like ceramics or crafts to buoy up slump-time sales, even if these lines do not seem to jibe with some people's thinking about hobby shops.

If there is a successful hobby shop that you can look around in, you can get a good idea of the general stock you'll need. And knowing what types of models are preferred in your locality is a big help. Also, if you have back-issues of good hobby magazines you can be partial to the manufacturers who advertise consistently and have been in business a while. Knowing the quality and completeness of various manufacturers' kits is a great help too.

Finding the right jobber can be a problem in an area where several can service you. Most jobbers understand your problems and will start you off with enough fast-moving material so that you can get going rapidly. However, there are in any group of humans some who will be greedy, untruthful and short-tempered; jobbers are no exception. Assuming that you know enough of human nature to be able to find the right jobber, place your faith in him and "play ball" with him (he has his rough periods when he must pay off his bills too). And don't carry along any preconceived ideas about what will "sell best" in your area. If you see that something is selling well that is outside your ken, study up a little on the subject. You can not speak authoritatively on a hobby if you haven't tried it or studied it yourself.

Amen!

AUTO DESIGN COMPETITION

FIRST

\$50 AWARD



A sports coupe by Gerald G. Post of Wausau, Wisc., presently in service with Navy. Built on short wheel base, approximately 100 in., it has fiberglass body, is powered by a 130 hp V-8 engine. Low weight to power ratio gives car good performance. Interesting features include safety belts built into arm rests which separate the two bucket seats. Belts are on spring-wound reels with pushbutton adjustments. "Stick" gear lever is mounted on transmission tunnel. Leather upholstery.



SECOND

\$25 AWARD



A sporty looking family sedan by Edward Collin of Beaver Falls, Pa. Designed on a 118 in. wheel base chassis. It features the modern "forward look," hooded lights and wrap-around windshield. The body has a pleasing blend of square and rounded forms with the sloping hood below the fender line. Powered by 300 hp engine.



Street and custom roadster by Collin Wilcox, San Luis Obispo, Calif. Suitable for "drags" or racing. Seat moves forward to insert roll-bar. Has full-house 1948 Mercury engine, dual ignition, lightened fly wheel, heavy duty truck clutch and 26-tooth Zephyr transmission. Car is painted black; white leather upholstery, chromed dashboard.



THIRD

\$10 AWARD

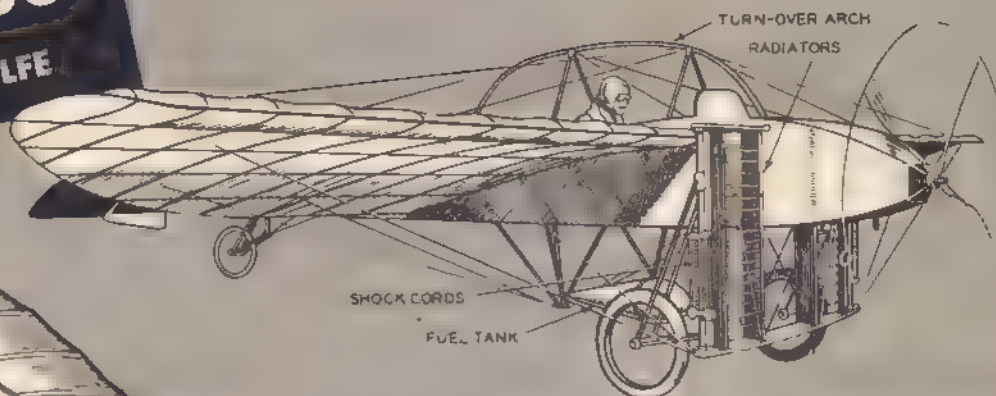
AWARDS OF \$50.00—\$25.00—\$10.00 EVERY ISSUE

Cash awards will be made each issue for the three most significant auto designs submitted to this magazine. \$50 will go to the top design, \$25 to the second and \$10 to the third. You may submit sketches for an original design auto, for a restyled car, for sportscar, family sedans, record cars, hot rods, military vehicles or unusual trucks. Include side, front, rear and top drawings, plus sketches of the proposed vehicle from three-quarter front and three-quarter rear positions. Sorry, we cannot enter into any correspondence about this contest. Send entries to Auto Design, c/o YOUNG MEN, 304 E. 45th St., New York 17, N. Y.

AIR PROGRESS

BY DOUGLAS ROLFE

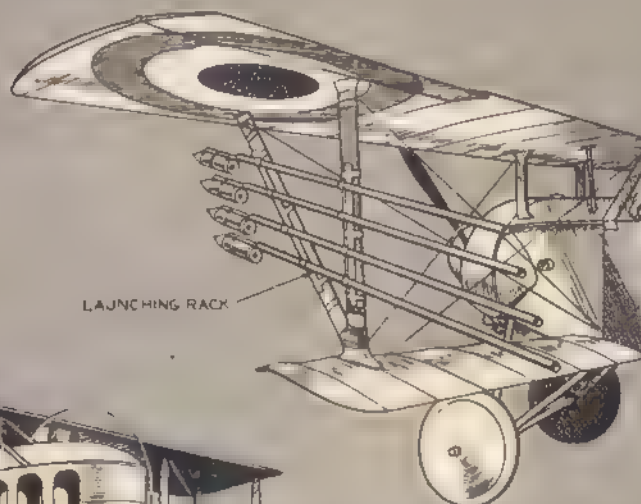
Milestones in Aviation History



The Bleriot Type IX was an experimental model produced by this famed pioneer pilot-designer in 1908. Had V-16 steam-cooled Antoinette engine totally encased. Also remarkable: four-bladed all-metal propeller: pitch of blades could be varied on ground.



Ellhammer's contraption, reputedly first Danish aircraft to fly. Covered tailwheel seems sole vertical surface, doubled as rudder. Engine unknown.



Detail of le Prieur air-to-air rocket missile installation on 1916 Nieuport Scout. First weapon of this kind; solid-fuel propellant. Electrically ignited.



First large U.S. aircraft specifically designed as a commercial transport, the Lawson Air Liner was powered with two 435 hp. Liberty engines and accommodated 26 passengers. The noted advocate of fuselage-wing aircraft, Vincent Burnelli, was associated with this 1920 design.

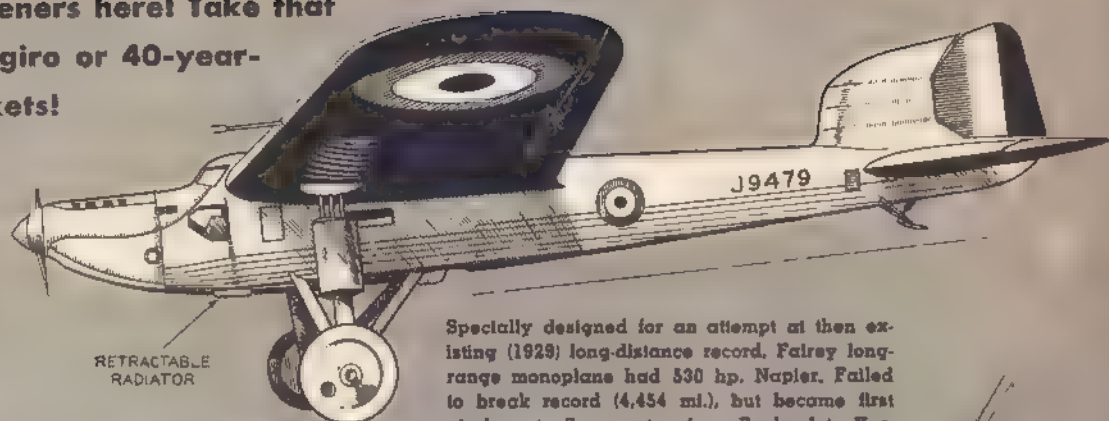


The "Cub" of its day, the de Havilland Moth (D.H. 60) was produced in large numbers and was popular with private owners all over the world. Model shown here is the very first Moth with a 27/60 hp. air-cooled Cirrus 4-in-line.

This edition of "Milestones" uncovers a variety of aircraft and aviation developments embracing a period of some 26 years starting with the unusual 1908 model Bleriot monoplane and ending with the first autogiros to approach conventional aircraft in appearance though still

lacking the tilting rotor control which made it possible to dispense with the auxiliary wings and tail surfaces. The Bleriot is peculiarly interesting. The enclosed engine, the use of an all metal variable-pitch propeller and steam cooling indicate remarkably advanced thinking. It may be a

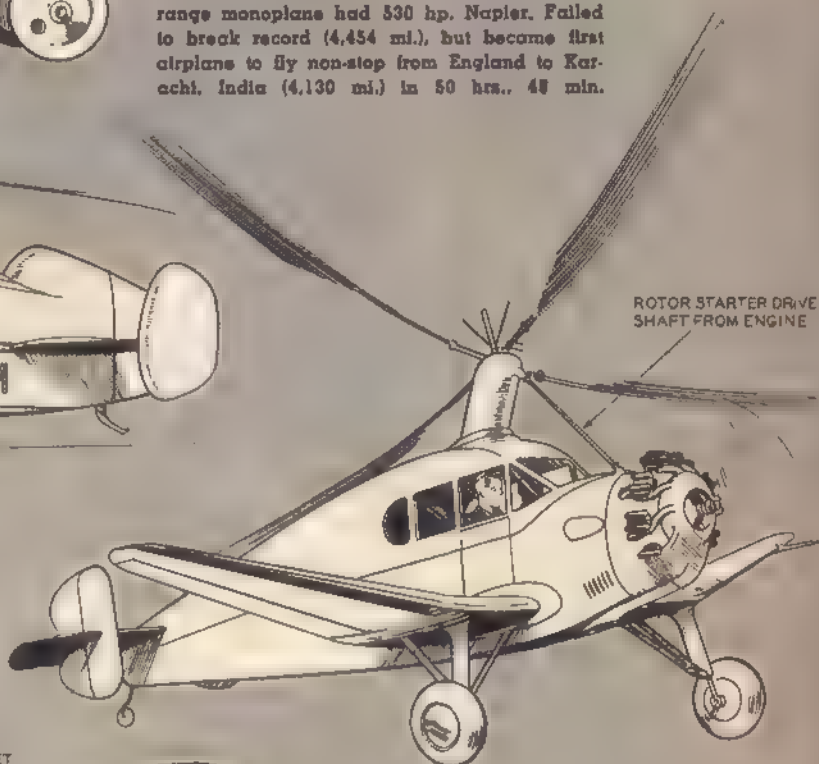
Some real eye-openers here! Take that de Havilland autogiro or 40-year-old air-to-air rockets!



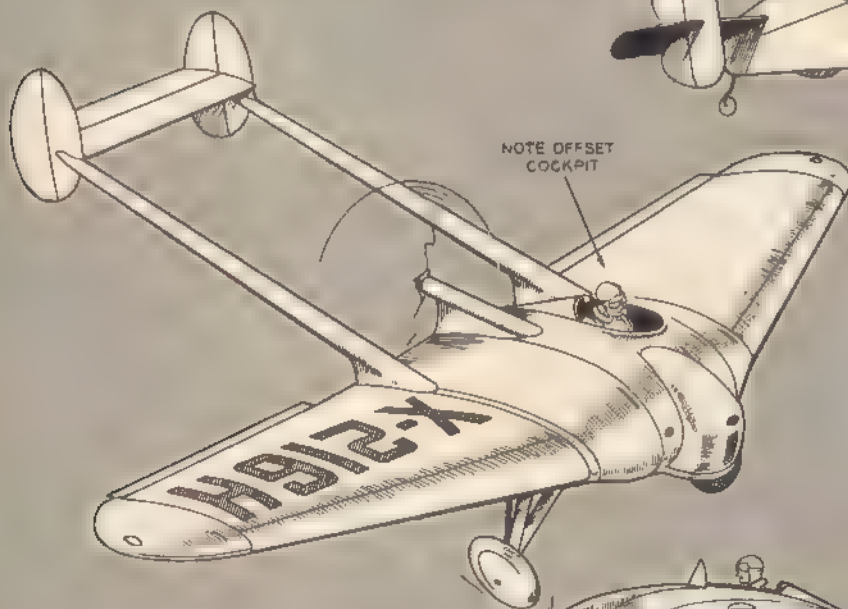
Specially designed for an attempt at then existing (1929) long-distance record, Fairley long-range monoplane had 530 hp. Napier. Failed to break record (4,454 mi.), but became first airplane to fly non-stop from England to Karachi, India (4,130 mi.) in 50 hrs., 48 min.



D.H.-built autogiro of 1931 with four-in-line engine and 3-bladed rotor. The tricycle landing gear is noteworthy.



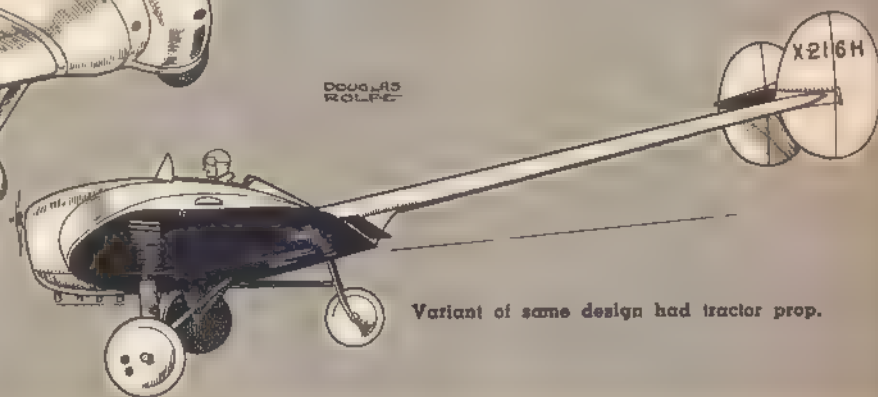
ROTOR STARTER DRIVE SHAFT FROM ENGINE



NOTE OFFSET COCKPIT

Two phases in development of autogiro. The de Havilland 'giro was first to look like a civilized aircraft. The 1934 Pittcairn (shown directly above) four-place cabin job was powered with Wright Whirlwind radial and was first U.S. cabin model autogiro. Both types accurately foreshadowed the modern helicopter in outward appearance if not in performance.

The Northrop Flying Wing was hardly such but was indeed the first U.S. experimental design headed in that direction. The craft illustrated here was powered with a 4-in-line Menasco engine and had, as shown, a pusher propeller.



Variant of same design had tractor prop.

surprise to discover that air-to-air rocket missiles were in use nearly 40 years ago, though employed only against enemy observation balloons. The de Havilland Moth airplane did much to popularize private flying in the twenties. The Lawson Air Liner likewise deserves a place

in "Milestones" since it was the first real U.S. airliner. Only one was built, but for its time it was as good as they came. Northrop's experimental Flying Wing, shown in two versions, was an interesting venture and ultimately led up to the true flying wings produced by this firm.

1. 1/8" sheet deck
2. 1/8" sheet
3. 1/4" sheet hatch
4. 1/8" sheet cabin roof
5. 1/8" x 3/8" planking
6. 1/8" sheet cabin trunk sides
7. 1/8" planking
8. Cut-out for portholes
9. Black window
10. Cockpit sheer
11. Hardwood engine mount
12. 1/8" balsa skeg
13. 1/8" plywood hydrofoil mounts
14. 1/32" mahog. veneer cockpit trim
15. 1/32" mahog. veneer cockpit floor
16. 1/32" mahog. veneer bottom planking
17. 1/16" sheet alum. hydrofoils
18. O.K. "Cub 099" engine
20. Small "Cub" flywheel

21. Universal joint to suit
22. 1/32 dia. brass shaft and housing to fit
23. 1-3/8" dia. Sterling propeller
24. 1/32" dia. wire tiller and rudder post
25. Rudder post housing tube
26. Rudder positioner
27. Sheet tin rudder
28. Typical notch for chine log
- A,B,C,E,F,G,H—1/8" sheet bulkheads
- D—1/8" plywood bulkhead
29. Perfect #12 fuel tank
30. Tank fill and vent
31. Fuel line to engine
32. Round toothpick staff
33. Flag or pennant to suit
34. Headless pin stanchions
35. Nylon thread rail
36. Woodscrews through into eng. mount



For running purposes cabin is removed from patrol boat if powerplant is air-cooled outboard (photo at bottom of page).

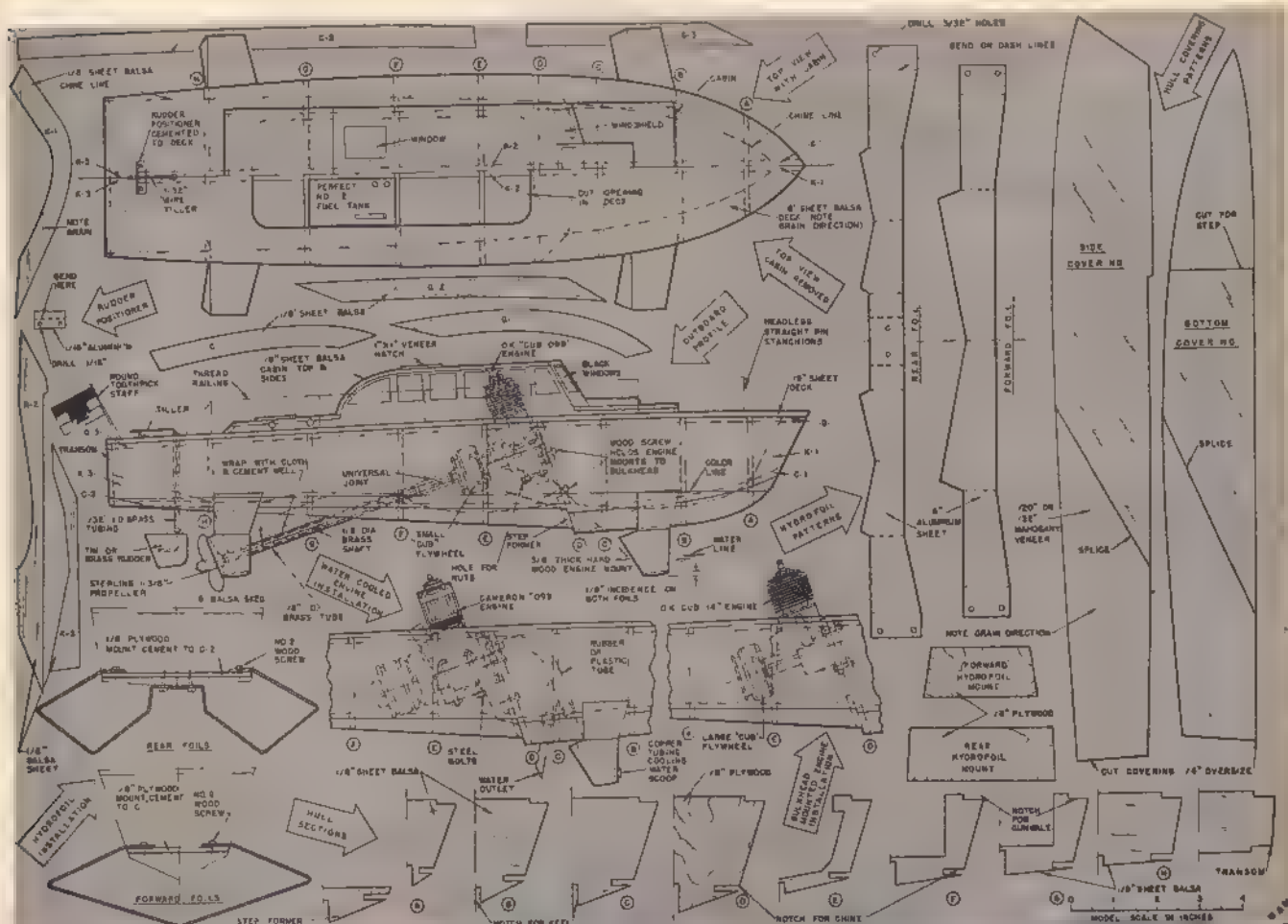
in full-scale hydrofoil design is that of controlling the incidence of the foils in order that they remain at a relatively constant depth in the water and do not rise to the surface.

Hydrofoil development has seen its greatest progress during the past half century. This is due to the fact that prior to the introduction of experiments in aircraft design very little was known of the dynamic action of airfoils in fluids. The first hydrofoil craft was operated in Italy in 1905 by Forlanini using ladder type foils. Shortly thereafter in 1906 Crocco of Italy attained 50 miles per hour with monoplane foils

with dihedral. Wilbur and Orville Wright, pioneers of powered flight, experimented with hydrofoils in 1907. Guidoni of Italy tested hydrofoils on seaplanes to assist take-offs in 1911. Dr. Alexander Graham Bell, inventor of the telephone, built an 11,000 pound hydrofoil craft with ladder foils that attained a speed of 60 knots in 1918.

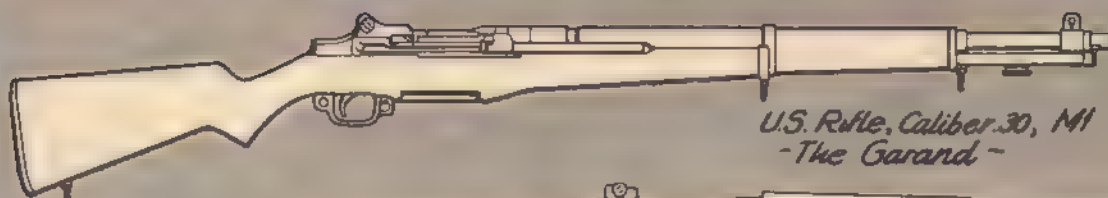
Interest in foils then lay dormant until 1932 when Dr. Otto Tietjins tested a hydrofoil speedboat in Philadelphia and another craft in Berlin in 1936. These craft used the "V" type of surface piercing foils. H. F. von Schertel operated a

(Continued on page 86)



Full-size plans for VS-6 hydrofoil boat are part of Plan #1155 from Hobby Helpers, 770 Hunts Point Ave., New York 59, N.Y. (50c)

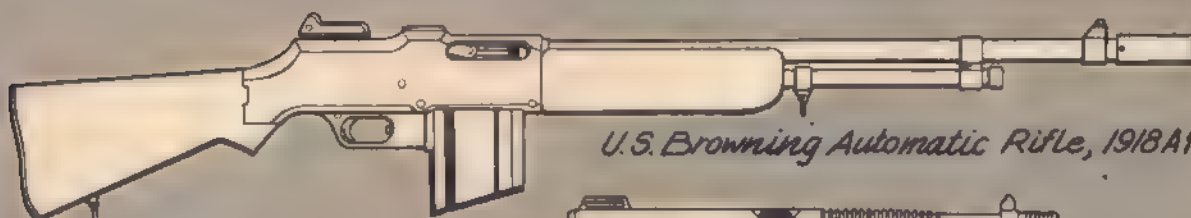
MODERN U.S. AUTOMATIC WEAPONS



*U.S. Rifle, Caliber .30, M1
-The Garand-*



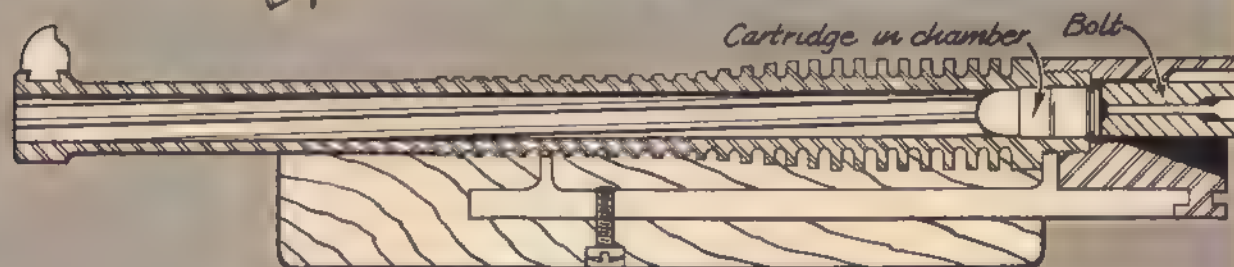
U.S. Carbine, Caliber .30, M1



U.S. Browning Automatic Rifle, 1918A1



*U.S. Thompson Submachine
Gun, 1928A1 - M1*



■ The invention and development of the metallic cartridge during the Civil War paved the way for development of modern automatic weapons. The famous Gatling Gun with its revolving multiple barrels was one of the first rapid-firing weapons devised. The first actual machine gun was the Maxim, invented around 1885. It operated by recoil principle. The force of the exploding cartridge drove the bolt back, ejecting the empty case after firing. Heavy springs drove the bolt forward, loaded the chamber and fired the gun again. The Browning system employed the gases from the explosion to drive the bolt rearward rather than recoil. All automatic weapons today are either recoil or gas-operated. During the first World War, the use of automatic weapons changed the technique of warfare. The guns provided the massive rifle firepower which enabled relatively small combat units to win decisive battles. The Garand rifle shown here is a semi-automatic, gas-operated

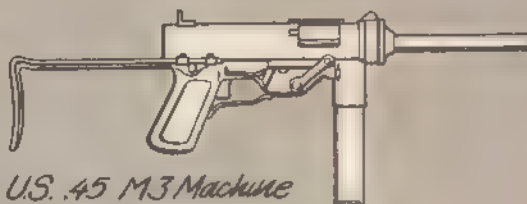
weapon which replaced the old bolt-action 1903 Springfield rifle at the start of World War II. The M1 carbine was developed to replace the 0.45 caliber automatic pistol and is also a gas-operated gun. It weighs just over five pounds and fires a 15-round magazine. The Browning Automatic Rifle (BAR), a gas-operated arm developed during the first War, was used throughout the second, and is still in service. The Thompson sub-machine gun (shown in cutaway), uses recoil or blow-back principle, as do the Reising and M3 machine guns. The larger, illustrated, machine guns are all based on John Browning patents and are recoil-operated. The U.S. Ordnance Department's T47 is gas operated and has an action similar to that of Browning Automatic Rifle, though considerably lighter. It is designed to shoot shorter 0.30 caliber cartridge. The T47 fires a 20-shot magazine, either semi or fully automatically. It is slated eventually to replace the M1 Garand.



US Rifle, T-47, one of the new models being tested by the Army to replace the M1 Garand.



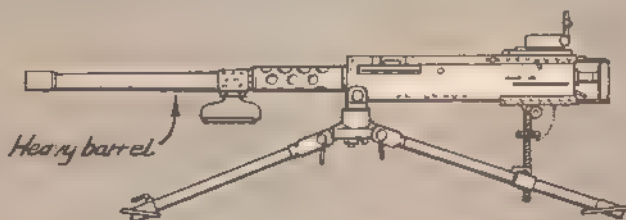
U.S. Reising .45 M50 Submachine Gun



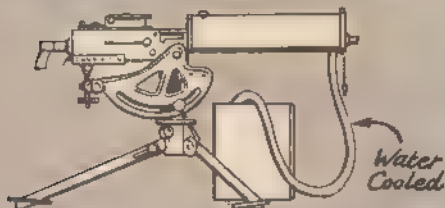
U.S. .45 M3 Machine Gun - World War II



U.S. Browning .30 1917A1 Light Machine Gun - air cooled.



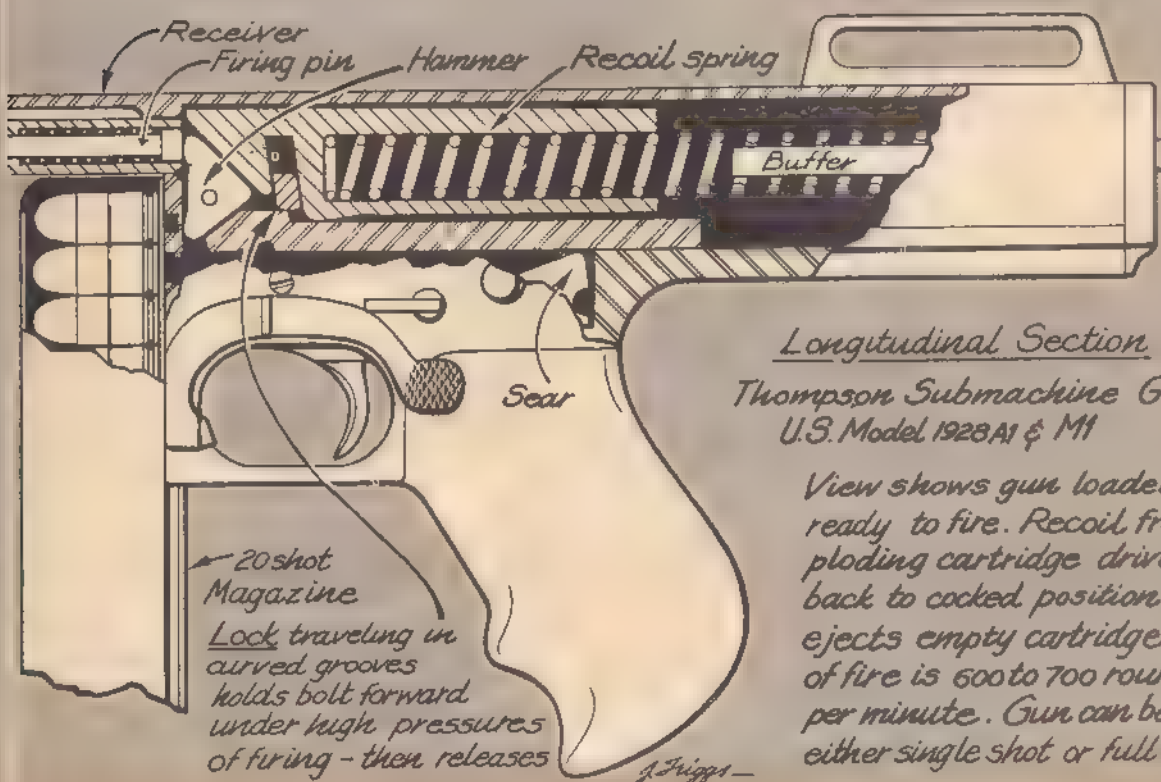
U.S. Browning, Caliber .50 M2 Machine Gun



U.S. Browning .30 1917A1 Heavy Machine Gun



U.S. Browning, Caliber 50 M2 Machine Gun Air-cooled Aircraft Model



Longitudinal Section

*Thompson Submachine Gun
U.S. Model 1928A1 & M1*

View shows gun loaded and ready to fire. Recoil from exploding cartridge drives bolt back to cocked position and ejects empty cartridge. Rate of fire is 600 to 700 rounds per minute. Gun can be fired either single shot or full auto.

J. Friggs

"Deluxe" Radio Control Installation For Model Boats

Dublin, Penna.

Dear Sir:

I am a model boat builder. I just finished a 31 inch Chris-Craft which I want to radio control. I have been shopping a long time and finally found what I want. Your article on radio control of boats on page 32 of the May issue is just what I'm looking for. I want rudder control and motor control as you have in your electric inboard set-up.

I am enclosing a stamped self-addressed envelope and would really appreciate it if you would sketch the wiring diagram out for me in not too complicated terms as you have pictured in said magazine. Would the rudder control have sufficient room in my particular boat? It is a standard Sterling model. Would it be possible to include speed control in this set-up of yours?

Very sincerely,
Wm. A. Weisbach

■ It wasn't long after the May 1955 issue was out that we began getting queries for more detailed information, exact ways various parts should be interconnected, etc. Since the "Electric Inboard" setup was the most complex, and seems to be of interest to many boat builders we give herewith a complete circuit diagram of the equipment shown in the lower photo on page 32 (all but the ping-pong balls!). Mr. Weisbach said he has a 31" Chris-Craft model, which would be ideal for this installation; note that quite a bit of weight is involved, the drive motor will take plenty of current and should be operated on at least one 6V. miniature storage battery and preferably two in parallel.

First step is to float the boat and set in it all the equipment, to see where things should go in order to have proper weight distribution. If the deck plan

and hatches will allow it, we suggest placing the components about as the photo indicates. The receiver is put in the bow, as far as practical from the electric motors which produce electrical "noise". Batteries may be shifted around as required to attain balance. The drive motor and the Multi-Servo that controls it will have to go about midships, of course, for connection to the prop shaft, while the elevator servo will be most conveniently placed at the stern, since it is used here for rudder operation. Incidentally, we understand that Babcock will no longer furnish the Bonner Servo that they have carried in the past; they have a new design of their own. We show the Bonner unit connections here. Undoubtedly the new servo will have the same three connections as has M3 in our circuit diagram.

After you have all parts placed for balance, and the mounting arrangements are made, you can get busy with wiring. The instruction book that comes with the Babcock equipment gives explicit directions for a wiring cable intended for use with the receiver, and we strongly suggest that this data be followed. All metal parts of the installation should be "grounded"—that is, fastened to a heavy wire running the length of the boat, this wire being attached to terminal 1 of the receiver plug. Units to be grounded include the frame of the rudder servo (there is a small lug on one end for this purpose) the metal frame of the Multi-Servo, and the electric drive motor frame. Ground connection to the latter must be made to one of the flat-head screws in the end of the motor; it will do no good to connect to the two metal mounting lugs which hold the motor down, since they are insulated from the rest of the metal parts by means of rubber grommets.

A wood block is cut to raise the Multi-Servo up so the center line of the bakelite disc is on the same level with the hole in the control lever attached to the drive motor switch. The hole in this lever should be filed to a slot about $\frac{1}{8}$ " wide; reason for this is that the Multi-Servo gives a $\frac{1}{2}$ " control movement while the Super Panther switch only takes $\frac{1}{8}$ " to go from forward to reverse. The Multi-Servo should also be mounted on the same angle as the drive motor—that is, slanting down toward the stern of the boat.

There is one other operation to be

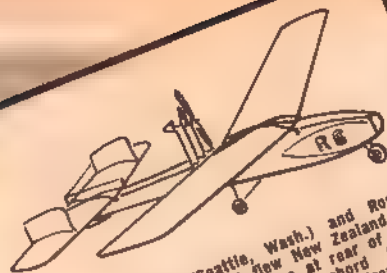
made on the drive motor. Remove the control switch by taking out the single center screw; take out the two upper flathead screws and make the counter-sinks in the bakelite end plate deeper, so the heads of the screws will be well below the surface of the end plates. The switch contacts on some motors hit these screw heads and this can lead to short circuits and fireworks due to possible grounding of the B2 positive terminal. When you put the switch back in place, do not tighten the screw too much; make it snug but without any bind, so the Multi-Servo can move it easily.

There is a slight fly-in-the-ointment in the method we show of working the forward-stop-reverse switch on the Pittman drive motor; the Multi-Servo is designed to work on only $1\frac{1}{2}$ V. while M3 must have 3 V. to do its job. We solved this by putting a small semi-adjustable wire-wound resistor R in series with the red lead from M2. This should be as specified in the parts list, and the slider will normally be secured in the center of the winding to give 2.5 ohm. If you find M2 tends to run past the stop positions, increase the resistance a bit, while if it won't start reliably every time, decrease the resistance. Of course, you can add another $1\frac{1}{2}$ V battery just for M2; if this is done the red lead would go to the positive side of the new battery, with the negative connected to the ground wire. We do not recommend running M2 from the $1\frac{1}{2}$ V. of B3; it might work OK, but the BCR-4 is a very sensitive receiver, and such a connection might cause interference trouble.

Note the condenser C which is mounted right at the drive motor terminals to suppress RF interference from the brushes. The Bonner servo and the Multi-Servo have these condensers built into them.

Now, what about the batteries? Our advice is to use the largest sizes your boat will carry comfortably. Some sort of storage battery is the only answer for the drive motor B2, and the NT-6 surplus units are cheap and plentiful. They will not hold a charge very long, but if you charge them up overnight, they will give plenty of power the next day. If your craft is large enough you might consider using two of them connected in parallel (plus to plus and minus to minus) to get greater capacity. Since neither

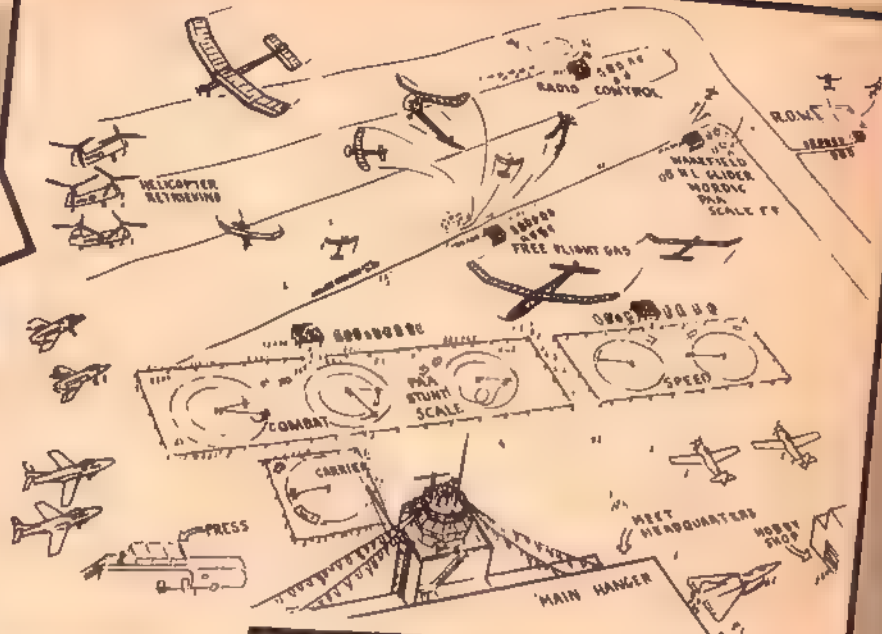
(Continued on page 85)



Eyvinn Schoenberg (Seattle, Wash.) and Roscoe Low (Santa Barbara, Calif.) flew New Zealand R/C design with high-mounted engine at rear of wing. Airtail aft of leading edge. 80% chord CG. Is quite steady; spectacular spiral dives.

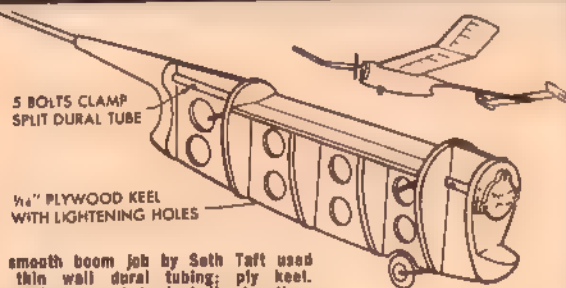


Parnell Schoenky (Kirkwood, Mo.) and Lawrence Conover (Oxford, Iowa) demonstrated these fine-flying ornithopters. Some flapped slowly like an albatross, others were real "nervous" with fast flapping action like a swallow. With 4 in air at once, spectators had tough time.



The "NATS"

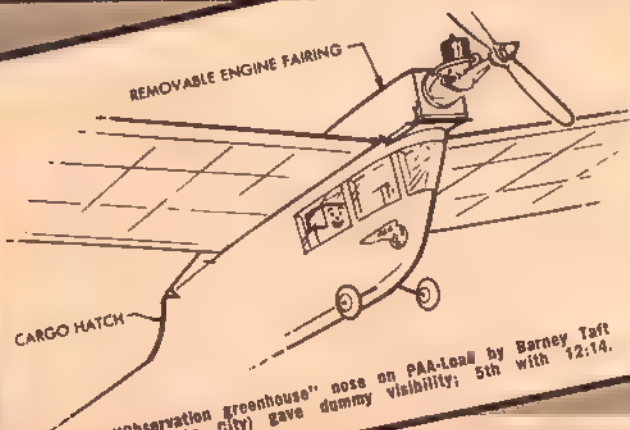
Lots of unusual, interesting craft at the '55 National Model Airplane Championships!



5 BOLTS CLAMP
SPLIT DURAL TUBE

1/4" PLYWOOD KEEL
WITH LIGHTENING HOLES

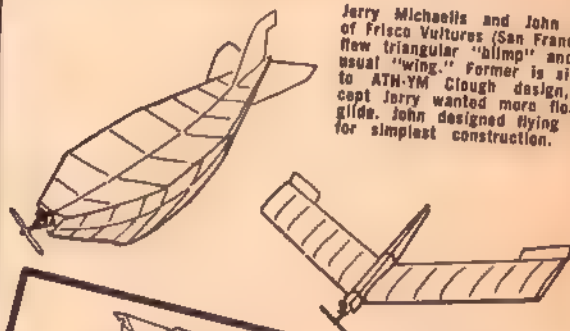
Very smooth boom job by Seth Taft used 24ST thin wall dural tubing; ply keel. Boom splits around keel, bolts together. Ends hammered flat at front, then bolted to firewall. Seth and Barney Taft, brothers, are real "idea" men!



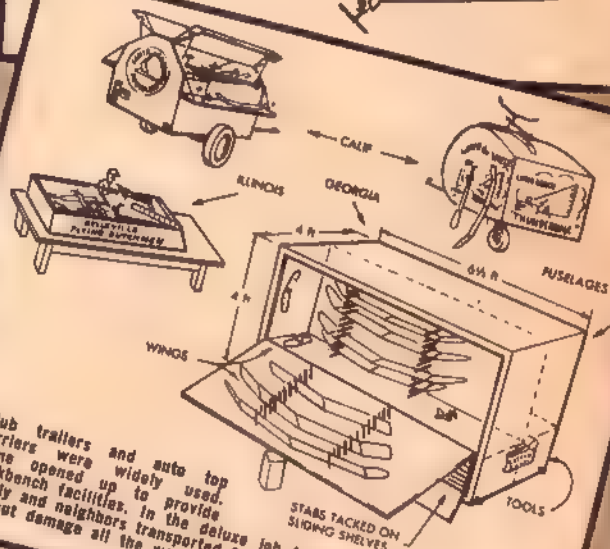
REMOVABLE ENGINE FAIRING

CARGO HATCH

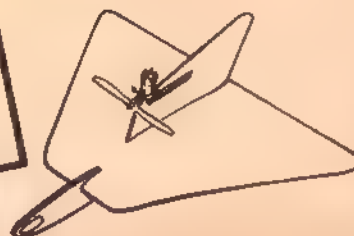
"Observation greenhouse" nose on PAA-Low by Barney Taft (Salt Lake City) gave dummy visibility; 5th with 12:14.



Jerry Michaels and John Tyler of Frisco Vultures (San Francisco) flew triangular "blimp" and unusual "wing." Former is similar to ATH-YM Clough design, except Jerry wanted more floating glide. John designed flying wing for simplest construction.



Club trailers and auto top carriers were widely used. Some opened up to provide workbench facilities. In the deluxe job from Georgia, A.L. Strickland transported 31 models (mostly 5-ft. free flights!) without damage all the way from Stone Mountain.



Bob Bowen (Torrance, Cal.) unveiled 22" span free flight delta. Configuration developed by Frank Dazey who did these sketches. Model flew with McCoy .09, weighed 1.5 pounds. Flew fast but stable.

Hobby

MODEL WORLD



Meet Brent Hawkins (above) from Morton, Ill.; this young fellow scored 4 first places in rubber events at the Nationals! You'll find more Nats photos here.



Thermal Thumber Robert Dagand, Los Angeles, 3rd in Nats indoor glider event. AP's Stewart Savage had hi time—1:10.

DOPE CAN

■ The 24th National Championship Model Airplane Contest conducted by the Academy of Model Aeronautics at the Los Alamitos, Calif., Naval Air Station, with the whole-hearted support of the United States Navy was probably the best of all "Nationals" from both the organization and flight performance standpoints.

Grand National Champion Willard S. Blanchard, Jr., 31, of Hampton, Va., who repeated his 1954 tops-in-model-props victory, had the super-distinction of receiving the warm good wishes of 1) Secretary of the Navy Charles S. Thomas; 2) Miss Universe (1955 version), Hellevi Rombin, 21, of Sweden; Queen of the Meet, Marla English, Paramount Pictures starlet; and approximately 700 fellow competitors.

Senior class championship honors went to Don Alberts, 20, of Albuquerque, N.M. Tops among the junior flyers

was David Arne, 14, of Yuba City, Calif. National Team Championship crown was won by the Los Angeles Thermal Thumbers Club's Team #1.

Blanchard, incidentally, a B-24 pilot in World War II, placed only once in the first three top positions of any event (he took 1st in the PAA-Load International open class), but he competed in so many events and flew so well he won championship honors handily.

As is its usual custom "Air Trails Model Annual" conducted a survey among top winners and will have a complete rundown of the entire competition in its forthcoming issue.

Top Test Pilot Proxy-Fathers Modeler. Thanks to the North American Aviation (F-86's, F-100's, etc.) "Skywriter" we learned that when Bedford (Bud) Joyney, 14 years old, Memphis, Tenn., entered his 9 planes in the Los Alamitos NAS "Nationals," he voiced a loud "thank you" to one of North American's top test pilots, J. Ray Donahue.

Donahue acted as a sort of "model flying foster father" to Bud all because



Preston Foster looks understandably happy over Medley's 20" "Cheryl Ann" model of his famous TV program tugboat.

the company pilot was chairman of the California State meet last year. Bud and his father were planning to attend that '55 Nats together but the latter became ill and couldn't make the trip. Rather than force Bud to drop out his father appealed to the Exchange Club of Memphis for assistance.

The Memphis Club, familiar with Donahue's model efforts contacted the Westchester, Cal., Exchange Club. This group had no trouble locating the N.A.A. pilot—he's a member. The flyer was more than willing to "look after" young Joyner, he said. The father of four youngsters, himself, Donahue realized how important the competition would be to the Memphis lad.

When Bud arrived at Los Angeles International Airport, Donahue met him, showed him some of California's points of interest, took him on a tour of North American production lines, then flew him to Los Alamitos in a company utility plane.

Certainly that was a trip, a reception,

a tour and a contest that Bud will long remember. And the Exchange Clubs of Memphis and Westchester deserve a pat on the back for the part they played in this happy story.

Pen Pals Wanted. Harry Holmes, 19, of Oldham, England, is looking for a correspondent in the U.S.A. about his age and interested in scale models and naval aviation. Harry will swap mags, photos and data. He lives at 46 Greenwood St., Oldham, Lancs., England.

Another overseas would-be writer is W. Cooper, 28 Debenham Rd., Moss Park, Stretford, Manchester, England. Mr. Cooper is 19 and a keen enthusiast of Wakefield flying. Says he's had a lot of invaluable experience flying alongside some of England's most famous competition winners.

Miscellaneous Meanderings. And some are pretty funny, too. Take the item from the Wichita "Hawksquaks" bulletin: "One hilarious moment came when a contestant waved his Half-A speed ship off and upon being launched it made half a lap in reverse before dumping out of the dolly; Thermal Hopper powered, no doubt." We note that the Wichihawks MAC have a "P.A.S.T." outfit to rival the West Coast's "F.A.S.T." club. In Wichita *past* stands for Payson and Alexander Speed Team. At one Amarillo, Texas, meet the PAST'ers took three firsts and a second in speed!

At a Waterbury, Conn., first annual stunt and combat meet 2nd place Junior combat man Bob Nadeau, Terryville, Conn., was observed giving his prize to an even younger entrant who cracked-up flying against Bob. The "CCMA News" also reported that at New Britain Wayne Russell set a new altitude record for control line flying.

Wayne was trying out his team racer when the down line snapped and plane, lines and handle all took off. After climbing in tight spirals to about 800 feet it descended slowly and was found by two small boys in a field one mile distant—without so much as a broken prop. Yes, there were plenty of witnesses; the model flew the following day



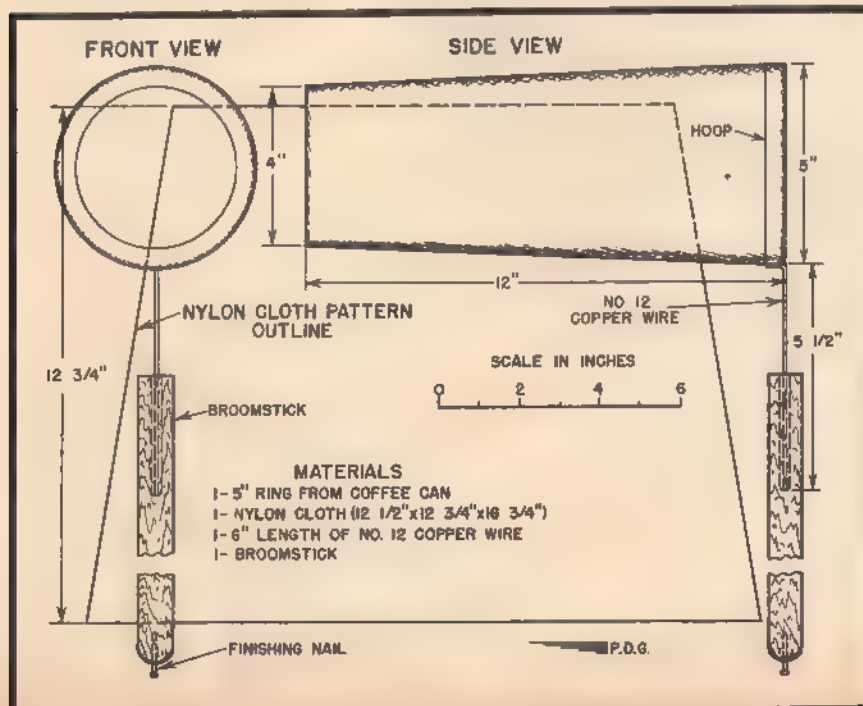
Oxford, Iowa's Dorothy and Lawrence Conover are caught once with a conventional type model. He enters every Nationals.

at a meet in Wallingford. It stayed on the lines, but didn't end up in the money. Probably figured that conventional round-the-circle stuff was too tame for it now.

Rules to Model By. Harry Royce of Harry's Hobby House (7204 S. Western Ave., Los Angeles 47) is the spark-plug behind the new Southern California Junior Model Airplane Association, and a mighty worthwhile organization it appears to be, too. The SCJMAA is designed for a single purpose, according to Mr. Royce, and that is to create more activity for young fellows just getting started in aeromodeling.

With this in mind the SCJMAA has no dues, no meetings, and is a non-profit group. The governing rules are well worth your study:

1. Promote good fellowship among modelers.
2. Never be late for a contest.
3. Always be helpful.
4. Show good sportsmanship.



After smashing a model during tests when the wind changed unexpectedly, the Rev. Donald P. Benoit, Edmeston, N.Y., decided a portable wind sock was needed. Any lightweight material can be used. First sew a half-inch hem along the 18" side. Then sew the 12" ends together wrong-side-out. Slip opened hoop through hem and turn sock right side out. Solder six-inch piece of heavy copper wire to hoop joint after rejoining hoop. "I found that by driving a #8 finishing nail into the other end of the stick," reported Rev. Benoit, "it could be easily plunged into the ground. Incidentally, the sock can also be held in the hand without the use of the standard."



5. Don't beef about the way a contest is run. The contest director is doing his best.
6. Never cheat.
7. Enter as many contests as possible.
8. Fly only in sanctioned areas.
9. Ask for list of sanctioned areas.
10. Always wish the other fellow "Good flying!"

Hobby dealer Harry is a hard man to overlook. He bills himself as "the biggest man in the hobby industry" and it seems pretty apparent that his heart is just as big as he is wide. He's always dreaming up new projects to interest the younger fry and is never too busy to stop and lend a helping hand to a beginning modeler.

Our congratulations and good wishes to the Junior Model Airplane Association. Harry's L. A. phone number, incidentally, is PLessant 2-2848.

Not Ahead of the Knot! In the Hamilton, Ont., Aero-Modelling Association's "Look-Out" we spotted a note to Vic Rayfield: "The idea in combat, Vic, is

to cut the streamer behind the knot, not ahead of it!" Reminds us of Leon (Zombie) Shulman's somewhat edgy remark to ground batteries when he was piloting a B-26 (Martin) during WWII that was doing target-towing duties: "Hey, you guys, we're pulling this target, not pushing it!" The H.A.M.A., incidentally, was last heard offering a half hour plane ride to the best designer of a new club emblem.

Hobby Items in the News. Also reports on folks you know in the hobby business. Bill Tenney of Dayton, Ohio, who used to be associated with the Dyna-Jet model jet engine is setting the world of speed boating on fire. He bettered his old Class B Hydroplane record with a sizzling 68 311 mph. The record run was made at the Knoxville, Tenn., Boat Club's permanent speed trial course.

After the new Midjet engine got in full production at Cheminol's Rivera, Cal., plant a unique occupational hazard developed. Test rack workers were attacked by bees who come awingin' at the bee-like whine of the miniature power plant. Seems the little buzzers got mighty mad when they found the call was mechanical instead of maidenly . . .

for awhile it was reported that Cheminol's master mind, Harry Rice, was afraid the coast of bee sting lotion would have to be figured into the price of the engine.

Sterling Models is all hopped up over its two latest offerings: a 33 inch span control line copy of Capt. Eddie Rickenbacker's World War I Nieuport "28" fighter. Length is 27 inches: it takes class B and C power plants. Also off the production lines at Sterling is the Super Ringmaster, a stunt and combat control line design by Matt Kania. This is the famous Ringmaster wing and tail with a built-up, streamlined fuselage. Spans 42 inches. For .19 to .35 engines.

In response to a large number of requests that the old-time "hard-to-make" models be revived, Cleveland Model Products Company (Custom Division—4506 Lorain Ave., Cleveland 2, Ohio) has released a score of Ol' Timer kits that should interest many modelers.

These kits will be made in very small lots and consequently will not be inexpensive, but they're still being sold at less than the price many collectors have offered for plans during the past few years. These models will be available direct by mail from the manufacturer while they last. Some have been out of production for a great many years.

With the revival of interest in the more hard to make "Do-It-Yourself" class of model building, Cleveland expects a healthy demand for the many kits offered. This might lead to regular production of new similar-type Cleveland kits available through hobby shops.

Among the revived numbers you will find the 1917 SPAD VIII (19" span), 1917 Fokker D7 (21 1/4"), Bayles 1931 GeeBee (17 1/4"), Curtiss Hawk P6E (23 1/4"), 1935 Mr. Mulhgan Racer (23 1/4"), Messerschmitt Me109 (24 1/4"), Curtiss P-40 Warhawk (28 1/4"), Vought F4U Corsair (30-3/16"), Republic Thunderbolt (30 1/4"), Focke-Wulf 190 (23 1/4"), P-39 Lockheed Lightning (38 1/4"), Japanese Mitsubishi Zero (29 1/4"), Republic SeeBee (28"), Grumman F6F Hellcat (31 1/4"), Boeing B-17 Flying Fortress (72"), North American B-25 Mitchell (55"), Northrop P-61 Black Widow (49 1/4"), Douglas DC-3 Transport (70 3/4"), plus many others.

Cleveland is asking modelers to state their preference for revival designs and to suggest other types which never appeared before in the Cleveland line. The concern was noted in the past for putting out what the modelers asked for.

After a rather serious auto accident Georgia's Howard L. "Larry" Cooper has returned to the modeling scene again

Senior Nationals winner in Class C free flight was Don Geiler, Monterey Park, Cal., with 27:28. Here he processes.



Hobbies in Action - \$25 Award Winner



"Last week I was with my friend Billy Friedman when he was flying his radio control plane. He forgot to wind his escapement rubber fully and lost control. I ran with him to watch him recover his plane and took this picture just as he came out of the water along with his helper. He'd been flying on the outskirts of Marine Park in Brooklyn. Speed was 1/200th of a second at 1/11 on Royal Pan film."—Daniel Wilensky, Lake Mohegan, N.Y. Dan wins this month's picture award; perhaps for this once we should title it "Hobbiests in Action." Get your entries in!

and is now associated with the Hobby Center in Miami, Florida (3621 S.W. 8th St.). Previously Larry was with Bentley's and the White Company in Columbus, Ga., and directed both the Trinity Angels model club at the Boys Club and another hobby group at the YMCA. He's an industry member of the A.M.A. and holds a contest director's rating. Welcome back, Larry.

Monogram Models adds another twin-engine plane to its line of Plastikit all-plastic models. This is one that a lot of folks have been requesting: the famous Douglas DC-3 airliner, nicknamed the "workhorse of the airways." The Monogram model is dressed up in the colors and insignia of Trans-World Airlines (TWA). Kit is complete with all plastic parts, and includes a pilot, co-pilot, hostess and passenger. Removable door with stair ramp is provided for the port side. Kit sells for 98c.

JASCO Models, Inc., formerly of Junior Aeronautical Supply Co. (203 E. 15th St., NYC.) announce the removal of their business to 883 Lexington Ave., Brooklyn 21, N.Y. (Glenmore 5-4188). Principals in the concern are Christine Zaic and her brother Albon Zaic.

Another new address: Citizen-Ship Radio Corp. is now located at 820 E. 64th St. (P.O. Box 5971), Indianapolis, Ind.

Something new in TV stars was Consolidated Model Engineering's new control line stunt and combat flying wing, the 35" "Wow" which made its debut coast to coast on NBC's "Home Show." Arlene Francis, mistress of ceremonies on the program, wanted to show how many fine things are possible through modeling, so Consolidated's Art Hasselbach was called upon to perform with a group of Model Knights. Films on the program showed Art's "Wow" in flight, then studio shots were broadcast of a construction session. This was the first in a series of weekly hobby sessions which will be a feature of "Home" programs.

Contest Chatter. At the big Indianapolis "Star" Allison Engine contest we noted with interest that 24 events were scheduled and for each event prizes consisted of a Brownie Movie Camera, 8x30 binoculars with leather case and leather companion-piece luggage. Total value of prizes exceeded \$3,500.

For the first time to our knowledge the aviation business gave its blessing to model aviation when the Aviation Industries Association issued a favorable memo to its members and at the same time the 1955 King Orange meet was endorsed by the Air Transport Association "as a most worthwhile event . . .

More National model meet photos: Winding indoor stick, Joe Bliqr who placed 2nd. He was 1st in open cabin, paper stick.



What's Your Hobby-Big Prize Each Month!



"My hobby is silk-screen printing," reports Donald Rosera of Racine, Wisc. "I became interested three years ago when I saw the art teacher in school engaged in this printing process that looked very novel and exciting. I acquired a few library books on the subject and after studying them sent for a mail-order course that provided all the information and materials for me to get started.

"With this process I found I could print on wood, metal, glass, paper and various other materials in several color combinations with splendid results. I have done some printing for several stores in town and have printed bookmarks for many of my friends. As yet I have not turned my hobby into a profession, but after I get out of highschool I will if it is possible."

Okay—now what's your hobby? If it's interesting enough to run, "YM" pays \$25 for your story and photo!

that serves the interests of air-age education." First man to crack the resistance "barrier" was Tom Sutor, president of the Exchange Clubs Model Aviation Corp., which will sponsor the Second King Orange Internationals modelplane competition in Miami on Dec. 30 and 31 and Jan. 1 and 2.

In its solicitation to the aviation industry for prizes, the King Orange representatives reminded air leaders that "this is for youth aviation and education . . . your contribution will be a direct investment in the stimulation and education of your future customers, engineers and employees. The King Orange Internationals is not a local meet. We

plan to build it into the leading model plane meet of the world. Last year's contestants came from all over the United States, Cuba and Venezuela. This year we anticipate over 500 contestants from many more places."

Entry blanks and data on the year-end competition may be obtained from the Exchange Clubs Model Aviation Corp., 368 Palm Ave., Hialeah, Fla.

Norwood, Mass., Society of Model Engineers ran off its second annual control line meet and when all the shootin' died down got out a nice bulletin which included thanks to "the wives of the contest committee members for their understanding and patience during the long

Again top man in radio control this year champion in the multi-class flying: Alex Schneider of San Francisco. Hard to beat!



Jerry Gross of Lakewood, Ohio, and Dad. Jerry took second in indoor cabin and third in indoor stick as senior flyer.



HOBBY MODEL WORLD

period of preparation." Incidentally, a lone gal entrant, Ann Robinson of Springfield, was awarded a special prize.

Swap Shop. A/2c George Crossen, AF-15501377, 2nd Fighter Sq., McGuire A.F.B., Trenton, N.J., has \$50 worth of unused R/C equipment (rcvr, transmitter, accessories) which he wants to swap for a movie camera.

Duane Butherus, Maplewood Academy, Hutchinson, Minn., needs a copy of the November 1948 issue of "Air Trails." Anybody got?

Wallace Briggs, 447 N. Main St., Logan, Utah, is looking for a Beechcraft and Aeronca Champion kit put out by the old Capitol Model Aircraft Co. Can anyone assist the gentleman?

Bernard Twardowski, 15 E. Union St., Nanticoke, Pa., has almost-new R/C equipment he'd like to sell (3PN Multi-Servo, Berkeley receiver, Bonner compound escapement, North American transmitter).

Willing to trade for R/C equipment or sell at their original price! Capt. F. J. Stander, Box 6875, Mather AFB, Calif., has these old Cleveland Master Scale kits: A-20, B-25, Tomahawk, Thunderbolt, Airacobra, P-38, P-47, Ju-87, Zero, Mosquito, and P51 (two of these). Says he: "I noticed that a number of persons are desirous of obtaining these kits. I would rather someone was building them. They are complete except for dope and cement."

(Hey, Ma, where's an envelope? Got an airmail stamp?)

—THE DOPESTER

WESTERN ROUND-UP

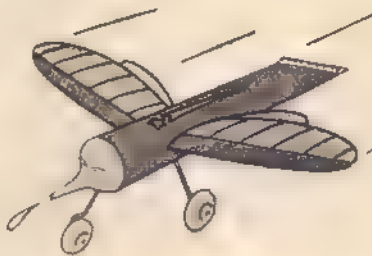
■ We finally managed to get to a WAM contest, this one at Modesto; needless to say it was a welcome experience. We saw evidence of thorough planning based on experience, a contest run by people who really know how, people who enjoy what they are doing and who unselfishly devote many hours to work so that others may enjoy themselves.

This WAM has a system, one which is different and one which really works. You guys who have to charge a late entry fee because you can't handle the entries, take note. The WAM representatives register, make out flight cards,

Hobby Club Emblems



Club flag or "burgee" of the International Model Power Boat Assoc. (2991 Garland Ave., Detroit, Mich.) is sold to members to raise funds for printing rules book and to advertise group to world at large.



The "Flying Glue Tube" is emblem of Tulsa's Glue Dobbers club which is only club to have presented two perpetual awards to National meet. Club spends much time running all types of air-model events.

"YM" pays \$10 for each emblem and report used here. Type data, send only printed emblems or decals—sorry, no pencil or rough emblem sketches can be considered.



Walter Mooney submitted this blue and white emblem of the famous San Diego Convair Aeromodelers. Design is emblematic of Convair's XF-92A, F-102, hydro-ski Sea Dart. Many famous modelers belong.



From Des Plaines, Ill., comes this amusing insignia which is the creation of the Des Plaines Piston Poppers. President is Emmett Carr; secretary, Herb Swanson (Rt. 2, Box 333); treasurer, Don Weber.

collect entries and program on the average of 20 seconds per entrant; this adds up to a staggering 3 per minute or 180 per hour! Let us try to explain how they go about it.

First in line is Mom Robbers, who types the name of the contestant, club and events on the entry blank, then on to Pop who classifies the contestants, numbers him, adds up the entry fee and supplies him with flight sheets, the next

man collects the entry fees, the next table processes, and, man, how those lines do move!

Each man or woman knows his job thoroughly, for they are appointed and the job is accepted for a period of one year.

You do not have to accept these jobs but the members look up to you and rarely is there an instance a worker doesn't show up. Another important job is that of property custodian who is responsible for all WAM property; there is a lot of this which adds up to a lot of money, but this stuff is strictly accounted for by the custodian.

Event Directors. Another thing the WAM has are event directors who work at their jobs for an entire year. It is the event director's responsibility to see that his affair gets started on time and runs smoothly. There is also a standing rule, which we believe is the best yet, that any trophy winner must serve as an official or timer if he is called upon to do so at the next contest. This is a good thing for you would sure be surprised at the cooperation and lack of gripes. This requirement gives the winners experience on the other side of the fence where they can see how things happen and what causes them. It also cuts out the leeches who never help out at any contest and who invariably do all the griping.

"My Favorite Model"

Winner of this month's \$25 award is Burt Nelson of Spring Lake Heights, N. J. He states, "This model of an F-80 is my favorite model because it was our first jet fighter and is still the cleanest. I saw the original in your centerfold several years ago and always wanted to build it. The model has won several scale events. It has about 30 coats of white dope, well rubbed. It is powered by a Dyna-Jet and flies between 80 and 100 miles per hour." Do YOU have a favorite model? Let's see pictures and have your reasons why!



When it comes to the flying, here the WAM also has a unique system. All ships, when a contestant desires a flight, must be put in line at that event area. Only the front five ships are allowed in the ready area where the lines are installed and the ships pull-tested prior to every flight. Each entrant must move his own ship. The only exception made is when one is judging, then he must put a card on the ship stating this and only then does someone else move his ship. It is sure something to see over 50 stunt ships in one line waiting flights, ships of every possible size, design and power from 20 inch Half-A models to 7 foot "C" jobs. Speed is run the same way and it can be said that a lot of flights are made in a very short time.

Modesto Highlights. Using this system, there were 216 entries processed and flown at Modesto, in 24 different classes. Seven entrants advanced in flying status, for they don't classify by age groups but rather on an "accomplishment" basis. Modelers start off as a beginner unless they desire to start in the higher advanced or expert classes. Then, according to what they are able to achieve, they go up. It is possible to be a beginner in A-B stunt but an expert in A speed or vice versa. As an example, Gene Durbano won A-B beginner speed closely followed by Dortha Lampson. Now due to their achievement they go up to the advanced group. Gene also went to advanced C-I in C-D speed. In C-D Melvin Del Torchio went from advanced to expert. Bob Allen now goes to A-B stunt expert while Joe Whitsett and Wally Reale go up to advanced in C-D stunt. This system of flying puts more into a contest than the age group separations. It puts the guys on a more equal basis and really gives you something to shoot at for all model builders like to be called experts and in the WAM they really have them.

Poor Communications. The International West Coast finals came as quite a surprise to us for it was held while we were only a few miles away yet we were completely unaware of it. They were run off at Beale AF Base after last minute transportation problems made it necessary.

The Nordic flyers found the going pretty tough on Saturday when it was necessary for them to fly their models in a 25 mph wind. Few of them had ever attempted this which quite naturally led to some smashed ships. Hank Cole got the only max in the first round to lead all the way. James Lang was close on Hank's heels till the third round when he came down in 48 seconds to ruin his chances; he bettered or equaled Hank's time in every round except the first and third to end up more than two minutes in second place, topping third place Carl Rambo by only eight seconds.

The Wakefield event was split over the two days with two flights on Saturday and three flights on Sunday. These flyers helped the Nordic flyers until their own time came up, praying that the wind would go down and shuddering to think what would happen if they had to fly, but the wind let up for some good flying weather to find at the end of the day that Fudo Takagi and Manny Andrade both had two max's and were tied. Manny slipped a little Sunday morning, while Fudo posted his third max only to have Manny post a third and a fourth max on his fourth and fifth flight, and then Forrest Allen closed with a rush to tie Manny in total time,



Johnny Brodbeck of K&B-Allyn provides his usual Nats motor repair service that has endeared him to many a modeler.

both of them with four max's and a 159 second flight. Andrade did 425 seconds in the flyoff, while Allen, who was up much better, suddenly dethermalized to land after 386 seconds (a dethermalizer on that sixth flight???)

The Power event opened with a rush with seven of the ten entries posting max's on the first round, but at the end of the second only Jim Walters had two max's. Two guys had four max's only to be beat out by Harry Gould, who had only three. Harry made a test flight at the end of the third round which almost cost him his chances for his dethermalizer malfunctioned for a flight of over thirty minutes, but it did come down and he did get in his other two flights so—the West Coast team for the finals in Wiesbaden, Germany will consist of Hank Cole in Nordic, Manny Andrade in Wakefield, and Harry Gould in FAI



Johnny's daughter Virginia turns the charm on Jerry Sanders. How could he resist the motor or the salestalk?

power, a team which, we believe, will be the strongest ever for these guys are good and they have good models, we have learned a lot.

Many thanks, according to Joe Bilgri, must go to Chester Wecker and Lyman Armstrong who made the contest a successful one despite the last minute change in plans.

Coming meets include the lakes meet by the Santa Barbara FAI team on October 23rd, Central Valley FF on October 16th, and Tulare R/C on October 8-9 at Tulare Airport.

SOUTHERN SCENE

Model Air Circus. With the tremendous task of raising \$4,000 to run off the

(Continued on page 86)

Most Realistic Model—\$25 Award Winner



Noel R. Hess of Salt Lake City walks off with the top "realism" award. This fine B-26 was built from drawings which appeared in this magazine. Noel reveals that "the landing gear is fully retractable in flight, nose wheel makes a quarter turn to lie flat, the flaps are closed when the wheels are up, as also are the bomb bay doors and wheel wellcovers. Model finished with Butyrate dope and rubbed and waxed. Torp .19's provide the power; 8/8 props are used for flying. The three-bladed ones shown freewheel and are for appearance only."



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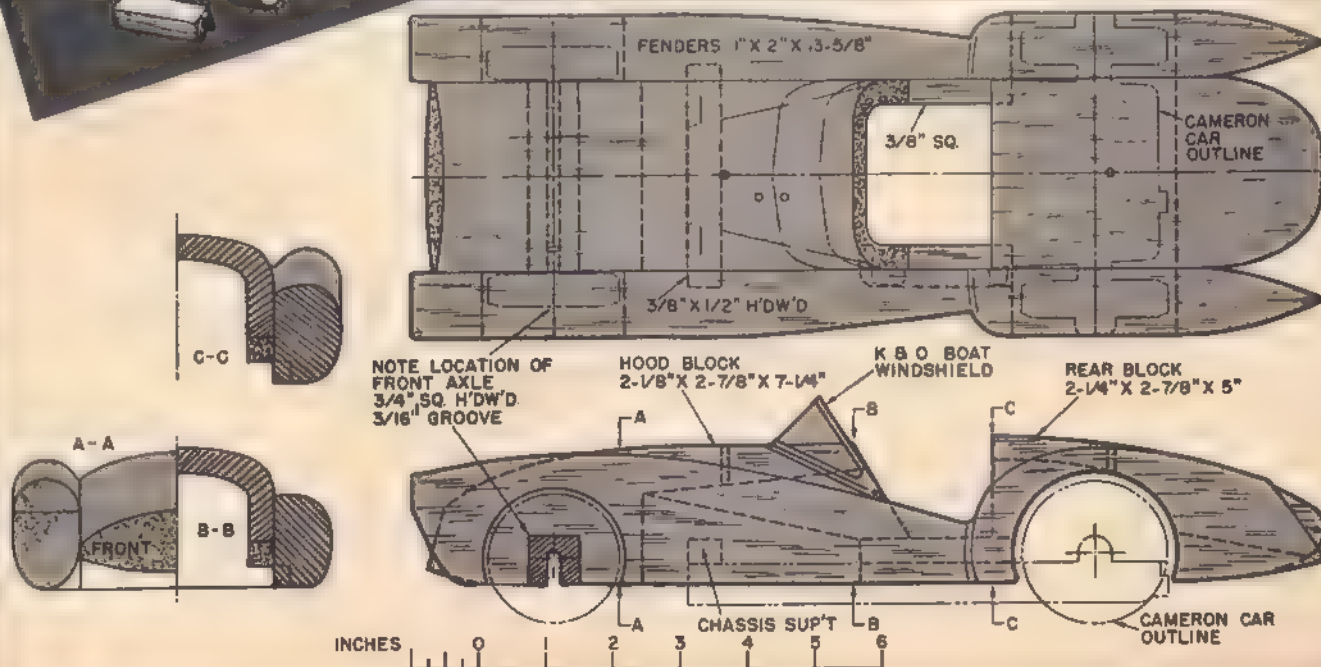
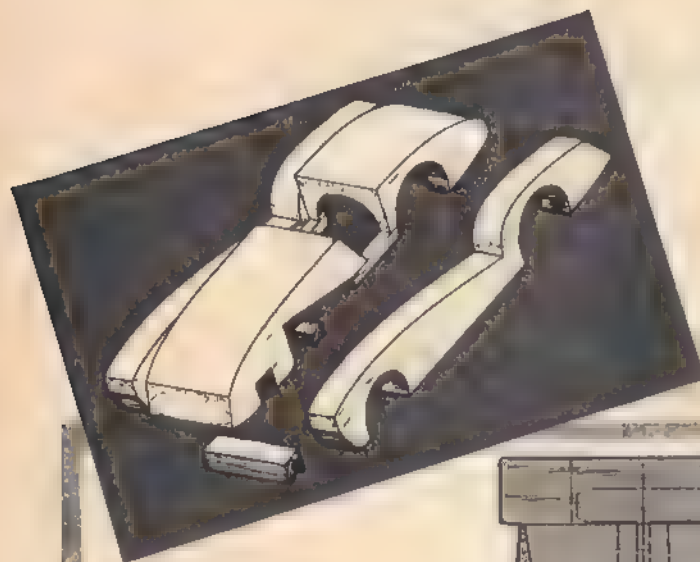


SPORTS CAR CONVERSION FOR CAMERON CAR CHASSIS

"La Marquise"

■ For that large band of model auto racing spectators who'd like to get out and try their skill, yet who continue meet in and meet out to remain in the background, here is a project that provides all the thrills of miniature racing, yet demands no special ability or tools.

In a deliberate attempt to provide a "low and slow" vehicle for backyard racing, "YM" has been testing this scale-like operating model of a sports car during the past few months. To minimize construction time and to insure a good running vehicle, an original sports body has been added to a Cameron racing car chassis. This vehicle was tested on the "backyard" race car track which was described and detailed in plan form in our September 1955 issue.

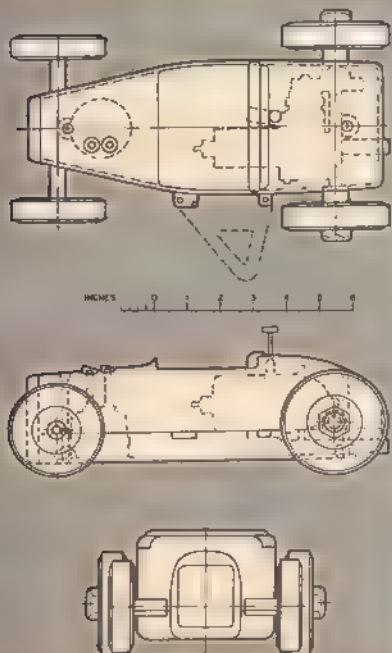


Tethered and operated as shown there, this realistic "La Marquise" will provide a lot of fun and excitement and is certain to stir up interest along sports car racing lines. That there is considerable potential in the racing of model sports cars is evidenced from the amazing response this publication has had to the two-part article: "Racing 'Em on Rails!" This feature appearing in the September and October issues produced inquiries from many model fans in many lands. For the first time enthusiasts saw some way to construct life-like cars of varying vintage in miniature and operate them side by side on a racing circuit at speeds low enough to let you see the action.

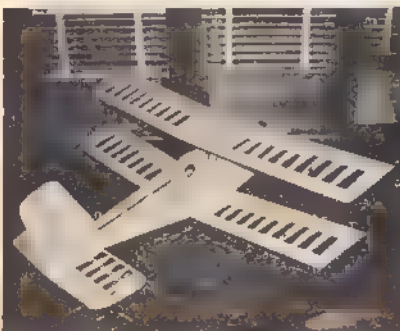
This all-important factor of cars running at good speeds, yet not so high that the spectator is completely baffled, can well be the difference between public apathy and a considerable amount of participation on the part of enthusiasts young and old, both here and abroad.

Construction of "La Marquise" is so very simple that the few drawings tell the story. You remove the front axle with wheels from the chassis of a Cameron car along with the race car body. You fashion a sports car shell along the lines and to the dimensions indicated. This carries the front axle in a hardwood inset. The new body is fitted to the chassis and—*voilà*—you're ready to take on all comers!

Full-size plans for La Marquise are a part of Group Plan #1155 from Hobby Helpers, 770 Hunts Point Ave., New York 59, N. Y. (50c).



HOT STUNT RADIO CONTROLLED BIPLANE



■ A project that has been cooking since 1954 has finally been completed, with the results you see here. The brainchild of Ernie S. Kratzet (from whose initials came the name of the craft—ESKIMO) this is thought to be the first non-scale biplane designed especially for multi-control stunt flying. Size of the craft isn't apparent till you check some of the specs—total weight, 13 lbs.; wingspan, 60"; $4\frac{1}{2}$ " wheels; Fox .59 engine. Ernie wanted something *hot*, and reasoned that multi-control would enable him to keep things in hand—though he fully expected to have to "fly" the plane every minute it was in the air. Both wings have 7 degrees of dihedral; another plane is being made to same plans by Bob Verhaeghe of Detroit, but has 3 degrees in top wing and 6 degrees in lower, also will have different engine—a Wasp .60. Interesting comparisons are looked for between performances of the two planes.

Due to a mistake in interpretation of his own drawings, Ernie made nose $1\frac{1}{4}$ " too short, so considerable nose weight was needed to attain balance; that nifty spinner you see weighs 12 oz.! Engine has 9 degrees down and 6 degrees side thrust, originally turned a $14/6$ prop at about 7500 rpm.

Radio equipment is Bramco throughout, and a Bramco throttle is fitted to the engine. Under hatch beneath top wing is an aluminum battery box fitted against forward bulkhead and filled with medium flashlight cells; this slides upward for removal, and has several sockets for connections. Next to rear, and mounted on weatherstripping, are the Bramco 6-channel receiver and the B battery. Engine throttle servo is under a nose hatch, while servos for the rudder and elevator are located in the rear cockpit.

One of Ernie's clubmates—Jack Lem-on, who is studying aero engineering—claimed that the fin area on the original design was too great. Said uncontrolled spiral dives would result. (Note large area in the uncovered shot.) First flights proved this to be true; Ernie neglected to cut the fin down, found the plane would make gentle turns either way O.K., and recover nicely. But put into a steep turn to right or left she would tighten up and spiral down, regardless of hard opposite rudder. Original area

(Continued on Page 39)

IT'S THE FINISH THAT COUNTS! PART VIII



San Francisco's John Tatone turned out this magnificent Meyers 145; took 2nd in 1955 Nationals' control line flying scale.



Claude McCullough of Ottumwa, Iowa, and new R/C, 4-wheeled Nats entry. A-1 finish.



Note all the attention Tatone's Meyers model receives from photo at '55 Nats!

HOW CONSTRUCTION AFFECTS THE FINISH

Correct building techniques for any model project can mean an easier, better finishing job; Paul tells how

By PAUL E. DEL GATTO

■ So far in this series on how to finish models you've heard from some very well informed and experienced model builders. But little emphasis has been placed on some of the general construction techniques which directly or indirectly influence the finish of a model.

Some facts about the materials used come in handy for anyone interested in building better looking models.

Balsa wood, our main construction material, is one of the most difficult of wood surfaces when it comes to applying a good finish. Couple this fact with the knowledge that balsa wood is cut several ways for varying degrees of strength, flexibility and weight, and the need for knowing how to select balsa becomes very apparent.

Look at the cross-section sketch of a balsa log. Note how it is cut. To begin with any log that is sawed from the center outward is known as a "quarter sawn" plank. Taking this plank and cutting it into sheets will yield balsa which in model lingo is referred to as an "A" cut. This type of sheet is most easily identified by its flexibility and velvety

feeling, and it is best used for planking large areas such as the wing and stab leading edge surfaces or for fuselages.

Logs that are sawn approximately tangent to the annular rings are often referred to as a "tangent slash" or more commonly as a "flat sawn" plank. Cutting sheets from this plank will yield "C" cut balsa wood and an intermediary cut referred to as a "B" cut. "C" cut sheets are instantly recognized by their speckled appearance and exceptional stiffness, a quality which makes a "C" cut sheet very valuable to a model builder. This stiffness is the result of the laminated quality of the sheet due to the perpendicularity of the annular rings.

Your "B" cut sheet is an intermediary cut between the "A" and the "C" cuts which has its annular rings running diagonally, rather than perpendicularly or tangent to the sheet. The "C" cut is best for most model use where strength and rigidity are required. However, "C" cut represents the smallest percentage yield of all the cuts which can be obtained from a log. When "C" cut balsa is not available, then use a "B" cut of slightly

greater thickness to compensate for the relatively lower stiffness.

Because of the spongy cellular structure of balsa it is subject to "breakers." "Breakers" are cracks or fractures at right angles to the grain which weaken the wood to a great extent. The bad part about them is that they are not easily detected until the wood actually breaks. Manhandling of the rough logs at the mill is the chief cause of breakers.

Another interesting quality of balsa is its great strength under direct compression. Rubber-powered model builders are perhaps more keenly aware of this because of the extensive use of $\frac{1}{8}$ " sq. longerons to produce a light structure, yet one strong enough to house a motor of up to perhaps twenty strands of $\frac{1}{4}$ " flat rubber. (Crossbracing balsa, diagonals and paper covering all serve to keep the longerons in direct compression, to absorb the load of the very powerful rubber motor.)

Thus the strength of balsa wood is determined to a large extent by the method of cutting used. Also a determinant of strength is the weight of balsa for each cubic foot. The average weight of balsa logs is 12 to 15 pounds per cubic foot; for identical cuts, wood that is lighter would be less strong and wood that is heavier would be stronger. Indoor model builders use balsa wood that may weigh as little as 4 lbs/cubic foot.

It is best to buy balsa wood when the most select cuts and light weight grades are available to you at the hobby shops you deal with and then store it at home for future use. This way, when you require something special you do not have to settle for something which isn't ideally suited to your needs.

Besides balsa wood, the various covering materials used on all types of models are well worth your attention. Covering represents the final stage in the model's construction and knowing how to cover and what material to use under varying circumstances is a "must."

Materials generally employed are tissue paper, light weight and heavy weight Silkspan, silk and nylon. All these materials are porous to varying degrees and this is one of the main reasons why doping is required after the covering has been applied to a model frame.

If we were to examine a piece of each material under a microscope we would notice that all the materials have a "grain" direction. This grain direction is important for it serves as a guide to the correct application of a covering material to either a frame or solid wood surface.

Of the covering materials generally used tissue paper is the most difficult to apply for several reasons. To begin with it can only be applied dry because it lacks the "body" of the other materials and when moistened tends to fall apart. Then too, its shrinking qualities do not lend themselves very well in areas where uneven shrinking is required. Round fuselages, curved wing planforms, wingtips and fillets are generally covered with one of the other materials unless lightness is a serious determining factor in the model's construction.

This particular advantage of light weight and the fact that an airtight smooth dope finish can be achieved with fewer coats than with the other materials makes tissue paper popular with rubber-powered and small free-flight gas model plane builders. The disadvantages possessed by tissue paper can be offset a great deal by exercising particular

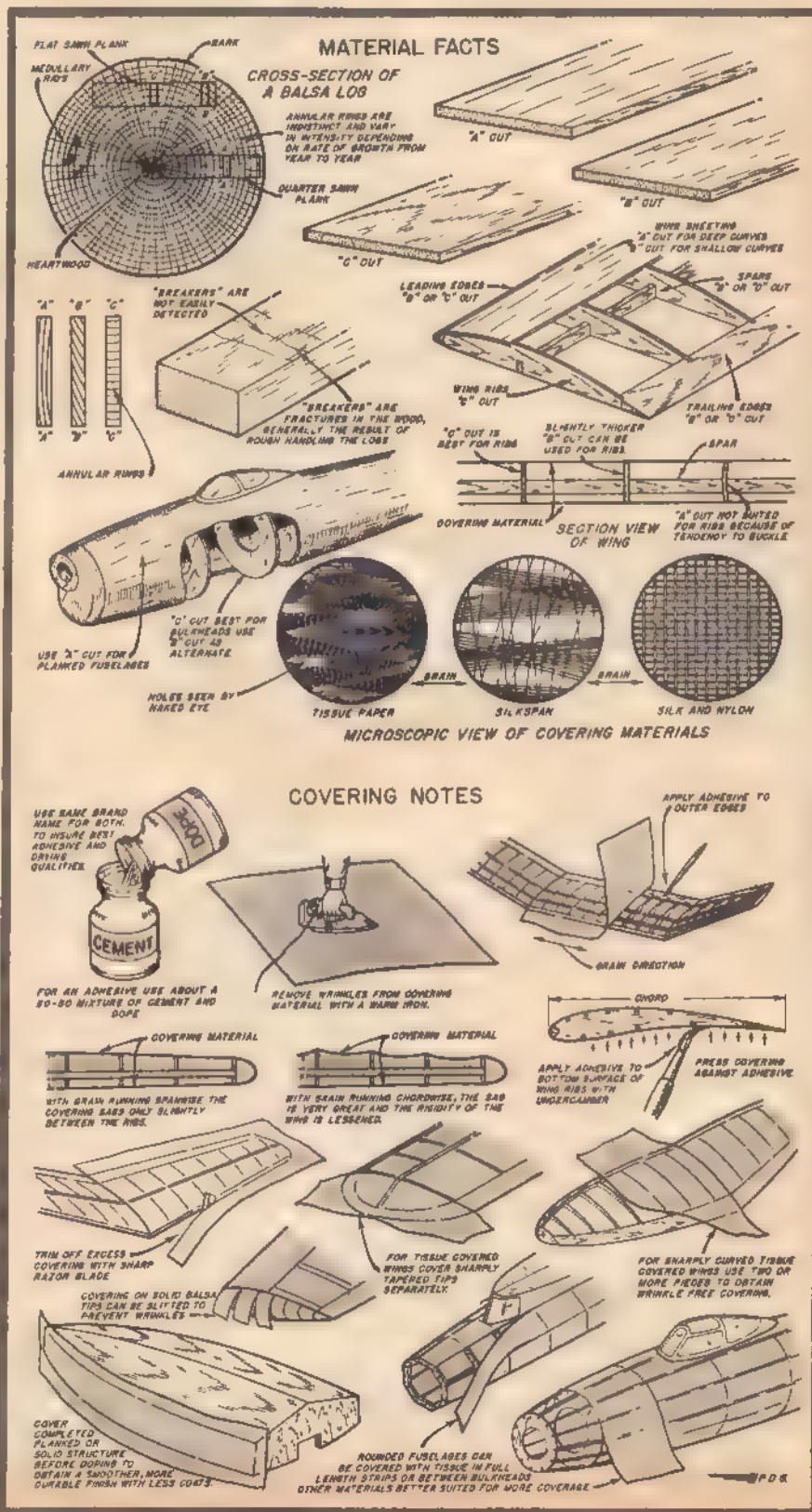
care on sharply curved areas

When applying covering to a wing we generally have two surface areas to cover: an upper and lower wing curvature. Prior to covering prepare an adhesive of approximately a 50-50 mixture of cement and dope. With a warm iron (not too hot) press out any wrinkles that may have been put in the covering material through folding or mishandling. Whether you cover the top of the wing or the bottom of the wing first or one panel at a time makes little difference.

Beginning at the wing center joint and

covering just one wing panel at a time, apply the adhesive only to the outer edges of the wing panel and wing joint for several rib stations and lay the covering on with the grain running in the same direction (parallel) as the leading and trailing edges of the wing. Pull the covering taut in all directions until all the wrinkles have been removed. Then follow the same procedure until the entire wing panel has been completed. Remove the excess covering material with a sharp razor blade.

(Continued on page 55)



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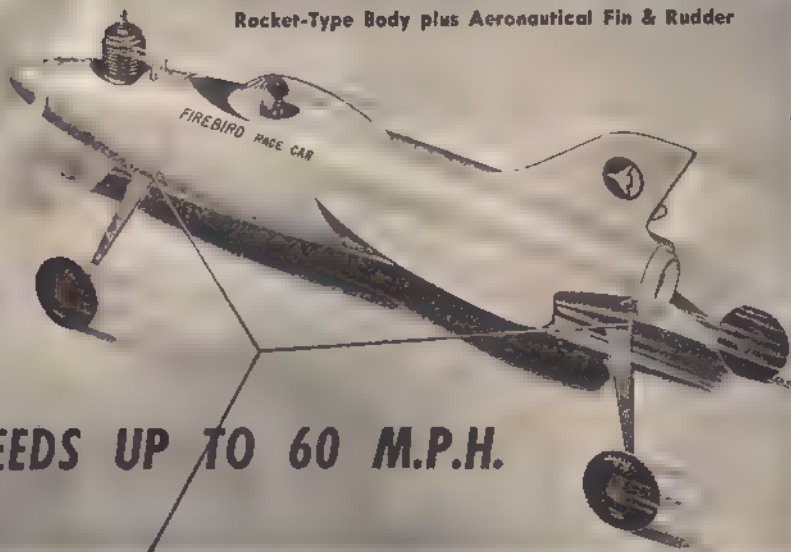
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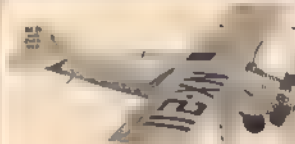
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Engineering Jobs in the Aviation Industry

Great new opportunities are opening up for talented young men . . . start preparing while you're in high school

By GENE KROPP

■ In the previous parts of this report, we pointed out many opportunities existing for you in today's aviation manufacturing industry. We showed that the pattern of these opportunities was similar in the manufacture of present-day airframe, powerplants and accessories. But how about the aircraft of the future? What opportunities are offered to you in this field? AND . . . is there still an opportunity for you to pioneer in aviation?

THE FUTURE AND YOU. You can be just as much of a pioneer today in aviation as those who charted paths through the wilderness of our country. You can tackle new problems and come up with new ideas just as the Wright Brothers, Glenn L. Martin, Glen Curtiss and others had to just fifty years ago. You can join the pioneers who are working in aviation right now . . . blazing a trail into outer space. The aviation industry is working on the aircraft of the future at this very moment. In fact, the aircraft industry today is putting as much money and development effort into guided missiles, which are the forerunner of the space craft, as it is into conventional aircraft. One large West Coast manufacturer recently appropriated a fund of \$10,000,000 to finance the establishment of a new scientific laboratory for research by its missile division. Another West Coast manufacturer has expanded its missile division from a nucleus of 50 research engineers in 1945 to a technical force of more than 5000 persons! Opportunities? . . . YES!

What type of men are needed? Because of the complex problems involved in missile design, several new job classifications have come into being. Why? These engineers are working on missile projects involving speed potentials of 18,000 miles per hour! Missile flight, leading to space flight, involves an entirely new set of rules. There are no past experiences to draw upon. Every new step is an uncharted step, not only in speed, but in materials of construction, powerplants, fuels and pilot reaction.

The engineers and scientists join forces in the design of the completed guided missile. The individual engineer has the opportunity to witness the complete evolution of the development project to which he is assigned. Important to any professional career are the associations with experienced personnel of demonstrated ability in this new and rapidly expanding field. You will work in such facilities as supersonic wind tunnels capable of making tests for anticipated velocities. Another of your laboratories will be the missile launching platform. You will be working very closely with powerplant engineers who are developing high-thrust engines involving rocket and nuclear power. Had you been "pioneering" in powerplants during this past year, you might have played a part in the development of the rocket engine capable of delivering jet horsepower substantially greater than the total power output of Hoover Dam!

If you like theory, the field of electro-

mechanical engineering will provide an exciting career in specialties such as automatic guidance systems, flight-and fire-control systems, auto pilots and instrumentation for missiles and advanced aircraft. The chart lists additional new job classifications which will be available after you have had some experience in conventional design.

So far we have talked only about missiles or rockets and the opportunities for you in this field. We must bear in mind that this is an extremely young phase of aviation . . . the stepping stone

to the nuclear-powered aircraft on which you may prefer to work. At least five aircraft manufacturers, two engine manufacturers and one major accessory manufacturer have made great progress in this field and in some cases conducted practical tests to show that the atom-powered plane will fast become a reality. In fact, the nuclear-powered craft is expected for military use in ten years. One international airline expects to be using atom-powered transports within fifteen years . . . maybe you will be in on the design!

NEW JOB CLASSIFICATION

POSITION	DUTIES	REQUIREMENTS	SALARY
Liquid Rocket Engineer	Work in advanced design of ballistic weapons and rocket engine applications	Degree and experience in propellant properties and rocket vehicle performance	Up to \$11,200 a year.
Thermal Analysis Engineer	Heat transfer work, design and development of heating and cooling equipment.	Degree and experience in heat transfer work	Up to \$8,800 a year.
Instrumentation Engineer	Design instrumentation systems for testing aircraft and missiles.	Degree and minimum of year's experience	Up to \$11,200 a year
Vibration and Flutter Engineer	Conduct studies in mechanical vibrations and flutter analysis and design and test flutter and dynamic models	Degree and a minimum of one year's experience.	Up to \$10,000 a year
Plastics Engineer	Develop uses for plastics in connection with primary and secondary structural members in aircraft and missiles.	Degree plus a minimum of three years' experience in the reinforced plastics field. Good knowledge of stress analysis	Up to \$8,800 a year.
Chemical Engineer	Conduct experiments in the fields of adhesives, surface chemist, and cleaning.	Degree and a minimum of three years' experience.	Up to \$6,950 a year.
Electrical Engineer	Design of electrical circuits power distribution systems, electrical installations and the packaging of electrical equipment for missiles.	Degree and minimum of one year's experience.	Up to \$10,000 a year
Servo Engineer	Specialty work in such fields as autopilot design and analysis, weapons systems aerodynamics involving dynamic and statistical analysis and inertial navigation system design and analysis.	Degree plus at least one year's experience. Courses in servos and cybernetics desirable.	Up to \$11,200 a year.
Electronic Engineer	Analysis and design of electronic circuits, interways components, antennas and radomes, electronic systems, packaging and the application and installation of equipment in missiles.	Degree and a minimum of one year's electronic experience.	Up to \$12,000 a year
Reactor Controls Engineer	Conduct analytical and theoretical studies on reactor controls problems and design and test of complete reactor control systems.	Degree plus two years' experience	Up to \$8,800 a year
Metallurgist	Deal with problems concerned with fuel element fabrication and reactor materials and handle problems in reactor materials corrosion and high temperatures.	Degree plus a minimum of two years' experience.	Up to \$11,200 a year.
Nuclear Analysis Engineer	Conduct analysis and make mathematical calculations in connection with reactor design problems.	Degree and minimum of one year's experience.	Up to \$8,800 a year.
Heat Transfer Specialist	Handle problems concerning nuclear reactor heat transfer and fluid flow	Degree and a minimum of one year's experience.	Up to \$8,800 a year.
Nuclear Power Systems Engineer	Analyze and design steam and electrical portions of nuclear power systems.	Degree and a minimum of one year's experience.	Up to \$8,800 a year
Nuclear Development Engineer	Conception and preliminary design of new systems in the nuclear power field and the determination of economic and operational characteristics of such systems	Degree and a minimum of three years' experience.	Up to \$11,200 a year.

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**Radio Control
Champion**
GIANT SIZE
50 1/2" wing • 35 1/2" body

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It's a thrill to see this big beauty rise from the ground, perform at your every command and return safely to you, magically controlled.

Radio-controlled for both
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License-free bands

Includes everything you'll need to fly the MacNabb 465 receiver, Bernal compound escapement and motor control units. Designed to protect your investment. Power 20 to 14.

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Beautifully pre-fabricated with all needed accessories
Constructed to stand terrific abuse
Assembled in a jiffy .14 to .19 power

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If not available at your Hobby Shop send direct to factory adding 25¢ packing and postage in U.S.A., 40¢ outside U.S.A.

**How Construction
Affects Finish**

(Continued from page 51)

When covering flat surfaces such as fuselage sides, the entire side can be covered with one whole sheet providing the covering material is sufficiently long. However, curved fuselage sides must be covered in smaller sections to minimize wrinkles. If tissue paper is the covering material use only one full-length strip or do one bulkhead section width at a time; for Silkspan, silk or nylon the area covered can be doubled and sometimes tripled.

Silkspan differs in that the main fibers intersect each other in clusters running diagonally with the grain, but they are more widely dispersed and held together by a loosely woven arrangement of fibers running against the grain. These differences explain its better shrinking qualities; the stronger fibers enable Silkspan to be applied wet to a model.

Silk and nylon are entirely different in structure from either tissue paper or Silkspan and are the most desirable of all the finishing materials to use from the viewpoint of strength and covering qualities. The fibers of silk and nylon are uniformly arranged and perpendicular to each other; the grain is determined solely by the closer spacing of the fibers in one direction than the other. Another interesting feature is that the fibers go over and under one another. On curved fuselages or pylons it is almost always possible to cover a whole side at once with silk or nylon, and it can be applied wet for maximum flexibility of use.

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FOR PLANES & BOATS

Bore .56"
Stroke .64"
Weight: 3 1/2 oz.
Capacity:
.35 cu. in.
Power: .23 hp
at 12,000 rpm



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No Other Engine Gives You All These Advantages

- Terrific torque . . . carries heavy loads at top speeds
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Give yourself a real treat with this high precision mechanical marvel. You'll get performance you never dreamed possible plus long life, trouble-free hobby satisfaction.

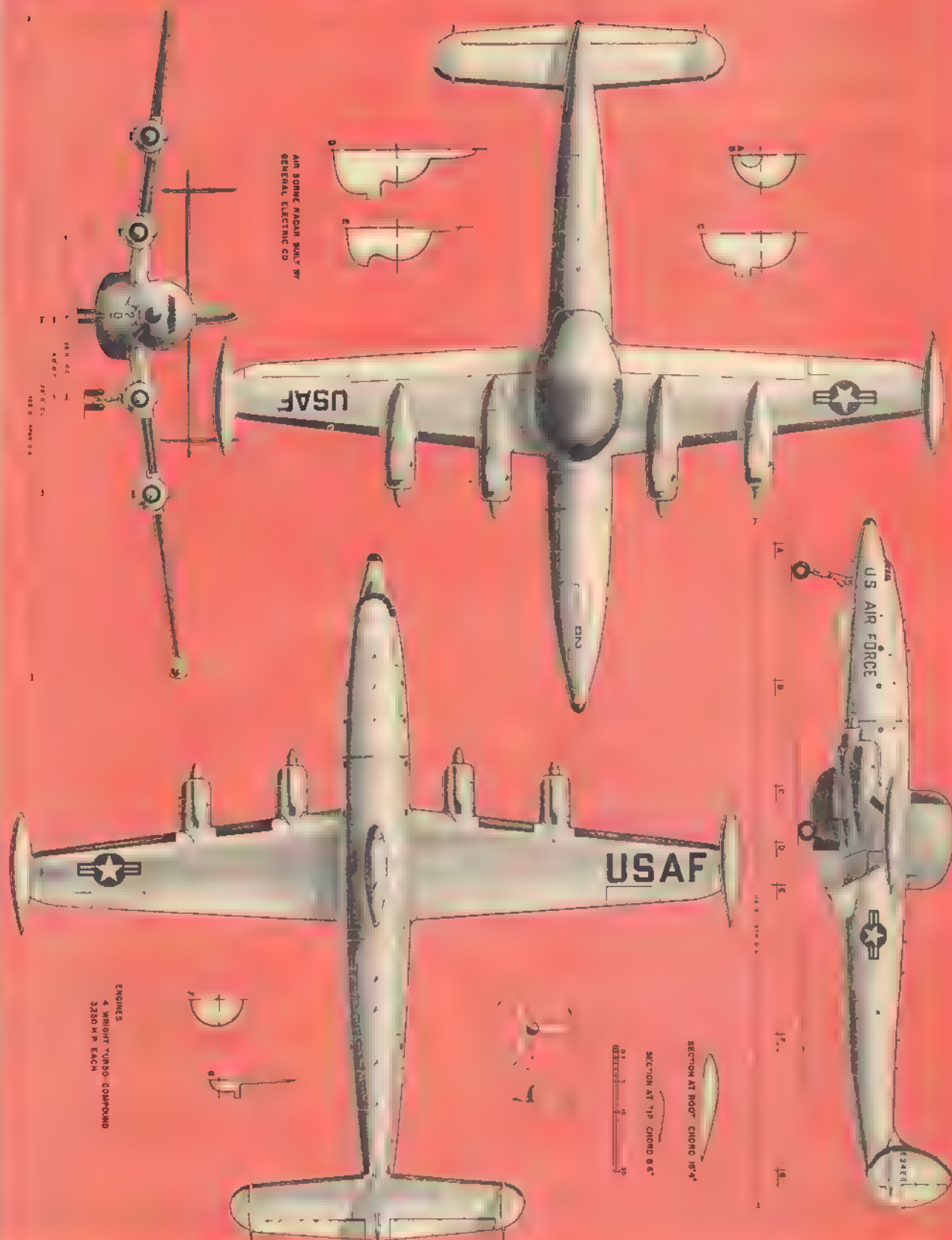
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Serving in role as an all-weather lookout, the EC-121G can hear search rays over great distances to detect aerial invaders long before ground radar is capable of spotting them. Once the intruder is found, its course is plotted from the

airplane and track against the enemy directed. The dorsal hump, bulge underneath and elongated nose house sensitive radar antennae. Craft carries total of 8 tons of electronic equipment, man of 22. Powered by four 3750 hp engines

14" long — \$2.50

BARRACUDA



* **FOKKER D-7**

18" span

\$2.95



"SPIRIT OF ST. LOUIS"
PROTOTYPE

24" span — \$2.95



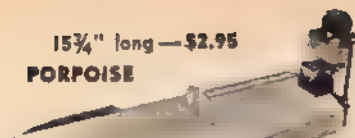
* **SUPER DING**
18" long — \$2.95

* with engine — \$7.50

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PORPOISE



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\$2.95



* **SKY SCOOTER**

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SKYLARK

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MASTER MODEL CRAFT

727 Westchester Avenue ★ New York 55, N.Y.

add 25¢ per kit by mail





Harold deBolt and his super-low-wing-loaded stunt. HdeB looks warmer than Swank (last column) with similar ship.

Everything Under Control?

(Continued from page 13)
other than 27.12 mc. Unlimited flights were possible, with contestants signing up to fly on a "ready list." There were about 5 flyaways and 3 or 4 serious clobbers. Top ten winners in each class, followed by points and type of equipment:

Multi Class; 1—Alex Schneider, 156.6 points, Rockwood 5-reed; 2—Bill Deans, 146, Racon 5-reed; 3—Dean Kenney, 138.6, Racon 5-reed; 4—Colby Evatt, 111.3, own 5-reed; 5—Dale Root, 103, Babcock 3-channel; 6—Dale Robbins, 82.3, 2 channel Tuned-Relay; 7—Dr. Hauck, 7 Babcock 3-channel; 8—L. D. Crisp, 75, Bramco 5-reed; 9—R. L. Schellenbaum, 70.3, CG 2-reed; 10—Gordon Gabbert, 70, Rockwood 5-reed.

Rudder Only Class; 1—Edward Friend, 76.3, Babcock single chan.; 2—Ernie Beckett, 72.6, Deltron; 3—J. H. Slovacek, 68.6, ??; 4—Dick Austin, 67.3, Citizen-Ship 27; 5—Chuck Boyer, 63.6, Babcock single-chan.; 6—Vic Nelson, 63.3, Deltron; 7—Art Sargenti, 60.6, Lorenz; 8—Stan Powell, 60, Lorenz; 9—Howard James, 57, Citizen-Ship 27; 10—Chuck Hollinger, 56, Babcock single-channel. In the Rudder group, all of those listed except the 3rd placer moved the rudder via a Bonner Compound escapement; Slovacek used a Bonner Standard.

While the hotshots came through as expected in Multi, the Rudder class was taken by a young fellow with little R/C contest experience, topping a field of older and more contest-wise operators.



Since we are on the subject of the Nats, note that it has been officially announced the 1956 Nationals will be held at the Dallas Naval Air Base (and unofficially—1957 at Willow Grove near Philadelphia, in 1958 the meet will go to Chicago, then back to the West Coast in '59).

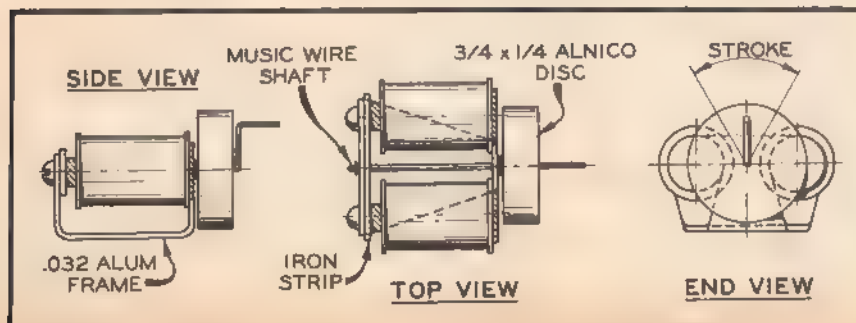
During a trip to Canada we attended one of their "Zone" Nationals—that for the St. Lawrence Zone. It had originally been intended to include R/C in this meet, but due to the unsettled licensing situation in Canada, the meet director decided to avoid sticking his neck—and the necks of all possible entrants in such an event—out, so R/C was not included, though there is much interest in it, and quite a few planes flying above the border. As we have detailed in a past Column, the present rules for Canadian R/C are pretty stringent, calling for a \$10 yearly license fee, inspection and approval of all transmitters by a registered

engineer, operation on 27.12 mc. and so on. As a natural result of these regulations Canadian modelers operate mostly illegally or they don't engage in R/C at all. Confusion was compounded recently when two Kingston, Ont., R/C'ers attempted to comply with the rules and sent in their application forms with the necessary ten bucks; both applications and money were returned to them, and they learned from the Kingston representative of the Controller of Telecommunication, Dpt. of Transport (this office corresponds to our F.C.C.) that the entire subject of model R/C was "under review" and that they could operate temporarily with crystal controlled transmitters on a frequency of 27.255 mc. In order to learn the status of Canadian R/C rules we visited Inspector W. B. Doubleday at his Kingston office and were informed that it is probable the \$10 fee will be drastically reduced, and that the Canadian R/C rules will likely end up pretty much like our own, which will be a blessing to those modelers who like to visit R/C contests on both sides of the border.

Canadian rules presently specify several possible R/C spots, including 13.56 mc., 27.12 mc. and 40.68 mc. There is no spot comparable to our 465 mc. Inspector Doubleday suggested that we advise Canadian R/C'ers to apply to their local Radio Inspectors (they are in all large cities) for permission to operate R/C equipment, which will be granted on a temporary basis on the 27.255 mc. spot. Needless to say, the more modelers who apply, the greater will be the likelihood that favorable rules will be forthcoming in the near future. Incidentally, our Kingston informants, Jack Luck and Ernie Houslander, tell us that Inspector Doubleday has been most helpful in getting the R/C situation straightened out and has, in fact, probably done more in this line than any other of the Canadian officials concerned with the problem.

We have heard that some R/C'ers had difficulty with Canadian Customs Inspectors, when they attempted to take planes and control equipment over the border. All this can be prevented if the owner will write to the Controller of Telecommunications, Dept. of Transport, Ottawa, Ont. requesting a registration form for your transmitter. Fill in and return and you will receive a postcard size Certificate that will calm down any Customs men that might be inclined to give you a hard time. Incidentally, present Canadian regs allow R/C on the 50

Known as both "Jaico" and "Gem" this tiny less-than-half ounce relay comes with 5, 7.5 and 10 thousand ohm coils.



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THE ULTIMATE IN RELIABILITY, MODEL B SPECIAL with SIGMA 26F relay 24.95

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Everything Under Control?

mc. ham band, but only above 53 mc.

Still on licensing matters, we come now to a situation that threatens the entire R/C fraternity operating on the 27.255 mc. spot. It came to our attention through Ed Breland (Station WAML, Laurel, Miss.). An oldtime R/C'er, Ed learned recently to his horror that a large trucking company in his area had obtained F.C.C. permission to install a radio communication system including a 500 watt base transmitter and 20-50 watt transmitters in each truck, *this equipment to operate on our 27.255 mc. frequency!* Ed had understood that radio communication on this spot was strictly prohibited; this had been our understanding, too. We promptly got in touch with Dr. W. A. Good, Chairman of the AMA R/C Committee, who did a fast bit of investigation, and found that the F.C.C. has indeed been issuing such licenses since May, 1954. Just what can be done is problematical at the moment, but an official protest has been sent to the F.C.C. through the AMA. R/C'ers are by far the most numerous licensees in this band, even though, as we have pointed out in past issues, only a small percentage of them have bothered to apply for licenses. What we can do is to undertake an immediate campaign to have every R/C operator send in his license right now. We have pointed out in the past the absolute necessity of licensing every R/C'er, if we ever expect to get more frequencies. Now we must point out it is imperative that all are licensed if we even want to keep what we have. This is no kidding matter or something to be put off till tomorrow—get your own license in, then see to it that everyone you fly with is properly licensed as well. We'll keep you posted on developments.

The AMA would like to receive full particulars of any authenticated cases of interference from such communication systems as mentioned above, which are working on 27.255 mc. But before shooting a letter in to the R/C Committee at 1025 Connecticut Ave., N.W., Washington 6, D.C., be absolutely sure of your facts; if you suspect such interference, it will have to be checked with a receiver to which headphones have been attached. Most AF tone receivers are usable this way, including the WAG receiver, all Babcock receivers and all



Oakland's Dale Root and "Ascender" job with 720 sq. in. wing. Babcock 3-channel.

reed receivers. It is quite possible that your interference might come from a station hundreds of miles away, because of a phenomenon known as "skip effect." Before you write, be sure of your facts, though; include date, your location, and call letters of the offending station.

Complete details of the KC/R/C Contest have come from Ralph Stoltz, who signs himself "Secretary and Retriever" of the group. Winners were: *Rudder Only* —1—Dick Arland (Des Moines); 2—Fred Sage (Independence, Mo.); 3—Dean Zongker (Wichita, Kans.). *Multi* —1—Dan Walters (K.C., Mo.); 2—Chas. Siegfried (Wichita); 3—Leland Weber (Topeka, Kans.). There were 33 official entries, and the meet was blessed with good weather both days. Dan Walters got the Best Finish award for his Rudderbug, while Worst Crapup prize went to Kenny Wright. Paul Runge, who also sent us some data on the meet notes that it was beautifully organized and run. He says Walters used 465 mc. with compound and plain escapements to attain 72 points, while Ziggy had two receivers on the 50 mc. ham band, and made 56 points. Both Rudder-Only top winners used proportional and received 76 and 61 points respectively. The meet will be held again next year and a real crowd is expected.

Radio Control Club of Chicago had 32 members at last report from Sec. Jerome Johnson (10805 Sangamon St., Chicago 43, Ill.). They have put on a real cam-

Having trouble with wiring? Meet Frank Krasne, 17, San Francisco, who built his own electronic computer. Four miles of wiring; relays made by hand; 6 months abuilding.





Ultra Yogi by E. J. Sigmon; 5' span; Cub .19 2-speed; completely free of engine torque.

paign to license all members, provide forms and even fill them out if need be. Two club meets have been held, and while weather caused plenty of trouble at both of them, it is felt such meets are a wonderful way to keep up interest. Jerry enclosed a snap of a new plane he had built, using unusual pod and boom fuselage with single wheel LG and twin skids on the stab. He says it was a disappointment, though; too much fin area and wing too low. It has since been rebuilt to more conventional form and is now a good flyer.

Lots of R/C activity around Toronto, according to Ken Laidman (15 Bayview Court, Apt. 5, Willowdale, Ont., Canada), and he asks that anyone in the area who is interested in this sort of modeling get in touch with him, as an R/C club is to be formed in the area. Ken's job requires travelling all over Canada (and the Eastern U.S.) so he has a fine chance to keep in touch with other radio builders.

Technical Topics. Two multi-control selector-type systems have come to light recently. One has been developed by Fred Collins (29 Stewart Ave., Pittsburgh 27, Pa.), who has spent over a year on the equipment. The selector has five positions, for left-right-up-down-motor and operates sequence fashion; you pulse from one to five and hold the desired pulse, to get control action. The selector will not work unwanted controls as it passes them, and it supplies the actual power to move the control surfaces. Unit weighs $\frac{3}{4}$ lb., all control operations can be had in 3 seconds or less.

Another selector device has been described to us by Robert G. Britt (400 Gregory Ave., Salisbury, N. C.), who has applied for patents on his unit. It does not supply controlling power, but rather closes control circuits up to twelve, as required. Circuits are so arranged that every one of the 12 controls can be put into a desired position and held that way, but on release of the control button, all will return to neutral. A pair of D cells has operated the selector for several hours. Basis of unit is two operating relays and a third "safety" relay, and best means of operation is use of some such device as a telephone dial which will send out rapid accurate pulses, but the selector can be pulsed by a simple pushbutton at the transmitter, if desired. Final model will weigh about 3 oz. and will be sold in kit and finished form. This unit functions in the same manner as the telephone rotary selectors which some builders have used for complex control systems, but since it is built specifically for our model purposes, it is very compact, light and of low power drain. Mr. Britt would like to hear from modelers interested in this

particular device.

Some builders have wondered if escapements have enough power to steer fast high speed models, and details of one "model" in this class seem to give us some answers. Dick Schumacher of Babcock Radio Engineering Inc. (Van Nuys, Calif.) writes of a 15 pounder built by Capt. Ollie Strickland, powered by a Fox 59 and fitted with Babcock 3-channel receiver and Compound escapement. Rudder had about 16 sq. in. of area and moved $1\frac{1}{4}$ " each side of neutral, was unbalanced. Plane flew at a measured speed of 60 mph in level flight, and even faster with slight down elevator trim, but rudder escapement functioned perfectly. It was powered by $\frac{1}{4}$ " rubber, had heavier spring and 3 V. on the coil.

Another "exploit" of Ernie Kratzet's big stunt biplane has come to light. Seems Ernie and some of his club mates were invited to fly their models in a demonstration for the American Ordnance Assoc. at Selfridge Field just outside Detroit, Mich. They flew from a golf course surrounded with trees, and the biplane ROGed after a 300' run in the rather high grass, but a sick engine kept it near the ground. After swooping among the trees for a minute or so, the plane lit about 40' up in the highest one. Since the show had to go on, a second plane was launched and made a good flight, but on the landing approach it passed directly over the tree in which the biplane (with switch still on) was perched, and spun into the same tree from about 100' up. Ernie's receiver apparently acted like a magnet to affect the receiver in the second plane and operate the reeds in the latter to produce the spin. Moral is not to attempt flights while a "live" receiver is up in a nearby tree!

Multi control using two Gazistor receivers on the 50 mc. ham band has worked well for Pete Bliss (47 Corning Blvd., Corning, N. Y.); sets are tuned to 50.3 and 53.4 mc., and he feels that a third receiver could be tuned between the other two, still without interaction. Pete notes that a vacationer stopped at the Elmira hobby shop and in the ensuing conversation said that Gazistors were widely used in his area (Euclid, Ohio), being preferred over most other types of receivers.

Replacement of an open coil on a Sigma 4F relay, with one from an old Kurman was accomplished by Richard L. Terry (814 S. 20th St., Mt. Vernon, Ill.); the U-core of the Kurman was utilized too. The slots in the metal points bracket of the Sigma were filed a bit to allow the Kurman core to come up to

(Continued on page 84)

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See Add'l. GYRO SPECIALS on Opposite Page

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THIRD

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AWARD



The "Eagle" is an intercontinental missile by Bob Hunt of Wichita, Kans., capable of carrying a nuclear or hydrogen warhead. Powered by two ramjet engines of 10,000 lbs. thrust each. It is launched by a 30,000 lb. thrust booster rocket. Wingspan is 23½ ft., tail span 13½ ft. Range in the vicinity of 5000 miles, operating altitude 75,000 ft., top speed 1400 mph. Can also be launched from military vessels against closer targets.

Rules governing this "aircraft of the future" competition are as follows: Three-view sketches of the envisioned aircraft will be required. These should be not less than 8½ x 11 inches for the entire three views. Give sketches of the complete airplane or space craft in three-quarter front and rear positions. Photos of a model of the proposed design may be included: information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the

editors and judges. The design may be of any type; space craft, commercial, military planes (fighters, bombers, troop transports), planes for the private flyer and sporting or racing planes. The entry each month judged the most practical or of the greatest significance will receive an award of \$50; \$25 for second place and \$10 for third. Mail entries to Aircraft Design Competition, c/o YOUNG MEN, 304 E. 45th St., New York 17, N. Y. The editors regret they cannot enter into any correspondence on submissions or undertake to return them.



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Electronics

(Continued from page 23)

These "honors at entrance" are highly publicized at graduation time while the scholarship grants, given to equally outstanding students, are not publicized since they indicate that the student could not afford to go to college without financial aid.

A great many national companies set aside part of their annual profit to sponsor needy students in college work. General Motors, the Sloan Foundation, General Electric, Westinghouse, Proctor & Gamble, Union Carbide and Lockheed Aircraft are only a few of the big companies that donate large sums for scholarships each year. In addition, many large industries like General Electric and Westinghouse make special employment and study opportunities available for

high school science teachers during vacations in an effort to foster a steady flow of engineering students into colleges.

Typical of the scholarship opportunities to be had today is the Lockheed Leadership Fund, now in its third year. Fifteen four-year full tuition scholarships, plus \$500 a year for personal college expenses, are made each year to students "on the basis of your qualities in leadership, good citizenship and moral character, your scholarship, aptitude for college work, and your ability to meet entrance requirements."

"The shortage of engineers and qualified administrators has become a serious handicap in the aircraft industry," explains Vice President Cyril Chappellet. "If we are to remain competitive in the air with the rest of the world, we must attract more college graduates to careers in aviation—particularly those who have

qualities of leadership as well as scholastic talent."

As with most other scholarships, selection of winners in this Lockheed Aircraft contest is left entirely to the judgment of the 15 participating colleges. Almost always, these scholarship recipients get good grades in college.

During 1954, the West Coast Electronics Manufacturers Assn. granted 17 scholarships in eleven West Coast Universities. L. Farrell McGhie, Assistant to the Dean of Stanford, said, "I was looking over the records of the three freshman scholars and thought you might be interested in knowing how the three WCEMA boys did during their first semester at Stanford. Awardee #1 had an even B average while awardees #2 and #3 had nearly an A average. I am sure that you and the other people at

(Continued on page 67)

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P-56 Mustang	2.75	P-57 Thunderbolt	2.75
P-58 Thunderbolt	2.75	P-59 Thunderbolt	2.75
P-60 Thunderbolt	2.75	P-61 Thunderbolt	2.75
P-62 Thunderbolt	2.75	P-63 Thunderbolt	2.75
P-64 Thunderbolt	2.75	P-65 Thunderbolt	2.75
P-66 Thunderbolt	2.75	P-67 Thunderbolt	2.75
P-68 Thunderbolt	2.75	P-69 Thunderbolt	2.75
P-70 Thunderbolt	2.75	P-71 Thunderbolt	2.75
P-72 Thunderbolt	2.75	P-73 Thunderbolt	2.75
P-74 Thunderbolt	2.75	P-75 Thunderbolt	2.75
P-76 Thunderbolt	2.75	P-77 Thunderbolt	2.75
P-78 Thunderbolt	2.75	P-79 Thunderbolt	2.75
P-80 Thunderbolt	2.75	P-81 Thunderbolt	2.75
P-82 Thunderbolt	2.75	P-83 Thunderbolt	2.75
P-84 Thunderbolt	2.75	P-85 Thunderbolt	2.75
P-86 Thunderbolt	2.75	P-87 Thunderbolt	2.75
P-88 Thunderbolt	2.75	P-89 Thunderbolt	2.75
P-90 Thunderbolt	2.75	P-91 Thunderbolt	2.75
P-92 Thunderbolt	2.75	P-93 Thunderbolt	2.75
P-94 Thunderbolt	2.75	P-95 Thunderbolt	2.75
P-96 Thunderbolt	2.75	P-97 Thunderbolt	2.75
P-98 Thunderbolt	2.75	P-99 Thunderbolt	2.75
P-100 Thunderbolt	2.75	P-101 Thunderbolt	2.75
P-102 Thunderbolt	2.75	P-103 Thunderbolt	2.75
P-104 Thunderbolt	2.75	P-105 Thunderbolt	2.75
P-106 Thunderbolt	2.75	P-107 Thunderbolt	2.75
P-108 Thunderbolt	2.75	P-109 Thunderbolt	2.75
P-110 Thunderbolt	2.75	P-111 Thunderbolt	2.75
P-112 Thunderbolt	2.75	P-113 Thunderbolt	2.75
P-114 Thunderbolt	2.75	P-115 Thunderbolt	2.75
P-116 Thunderbolt	2.75	P-117 Thunderbolt	2.75
P-118 Thunderbolt	2.75	P-119 Thunderbolt	2.75
P-120 Thunderbolt	2.75	P-121 Thunderbolt	2.75
P-122 Thunderbolt	2.75	P-123 Thunderbolt	2.75
P-124 Thunderbolt	2.75	P-125 Thunderbolt	2.75
P-126 Thunderbolt	2.75	P-127 Thunderbolt	2.75
P-128 Thunderbolt	2.75	P-129 Thunderbolt	2.75
P-130 Thunderbolt	2.75	P-131 Thunderbolt	2.75
P-132 Thunderbolt	2.75	P-133 Thunderbolt	2.75
P-134 Thunderbolt	2.75	P-135 Thunderbolt	2.75
P-136 Thunderbolt	2.75	P-137 Thunderbolt	2.75
P-138 Thunderbolt	2.75	P-139 Thunderbolt	2.75
P-140 Thunderbolt	2.75	P-141 Thunderbolt	2.75
P-142 Thunderbolt	2.75	P-143 Thunderbolt	2.75
P-144 Thunderbolt	2.75	P-145 Thunderbolt	2.75
P-146 Thunderbolt	2.75	P-147 Thunderbolt	2.75
P-148 Thunderbolt	2.75	P-149 Thunderbolt	2.75
P-150 Thunderbolt	2.75	P-151 Thunderbolt	2.75
P-152 Thunderbolt	2.75	P-153 Thunderbolt	2.75
P-154 Thunderbolt	2.75	P-155 Thunderbolt	2.75
P-156 Thunderbolt	2.75	P-157 Thunderbolt	2.75
P-158 Thunderbolt	2.75	P-159 Thunderbolt	2.75
P-160 Thunderbolt	2.75	P-161 Thunderbolt	2.75
P-162 Thunderbolt	2.75	P-163 Thunderbolt	2.75
P-164 Thunderbolt	2.75	P-165 Thunderbolt	2.75
P-166 Thunderbolt	2.75	P-167 Thunderbolt	2.75
P-168 Thunderbolt	2.75	P-169 Thunderbolt	2.75
P-170 Thunderbolt	2.75	P-171 Thunderbolt	2.75
P-172 Thunderbolt	2.75	P-173 Thunderbolt	2.75
P-174 Thunderbolt	2.75	P-175 Thunderbolt	2.75
P-176 Thunderbolt	2.75	P-177 Thunderbolt	2.75
P-178 Thunderbolt	2.75	P-179 Thunderbolt	2.75
P-180 Thunderbolt	2.75	P-181 Thunderbolt	2.75
P-182 Thunderbolt	2.75	P-183 Thunderbolt	2.75
P-184 Thunderbolt	2.75	P-185 Thunderbolt	2.75
P-186 Thunderbolt	2.75	P-187 Thunderbolt	2.75
P-188 Thunderbolt	2.75	P-189 Thunderbolt	2.75
P-190 Thunderbolt	2.75	P-191 Thunderbolt	2.75
P-192 Thunderbolt	2.75	P-193 Thunderbolt	2.75
P-194 Thunderbolt	2.75	P-195 Thunderbolt	2.75
P-196 Thunderbolt	2.75	P-197 Thunderbolt	2.75
P-198 Thunderbolt	2.75	P-199 Thunderbolt	2.75
P-200 Thunderbolt	2.75	P-201 Thunderbolt	2.75
P-202 Thunderbolt	2.75	P-203 Thunderbolt	2.75
P-204 Thunderbolt	2.75	P-205 Thunderbolt	2.75
P-206 Thunderbolt	2.75	P-207 Thunderbolt	2.75
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They're off at Indianapolis! Picture above shows free running outboard race at IMPBC's first regatta. Bob Peterson (5th from right) won it. Opposite page pic is line up of just about everything. Warren R. Pugh, Commodore, is 5th from left.

were made on them, but the same set gave quite a few long runs over a period of about 5 months. One of the same cells was used as a filament supply for the Mini-Mac receiver.

Figuring that we could get the actuator power drain still lower, a new one was made along the lines of the Mactuator (ATH, Nov. 1955) but with an alnico-5 disc magnet $\frac{3}{4}$ " x $\frac{1}{4}$ ", and two 300 ohm coils from surplus relays. This gives ample rudder pull at the current drain of about 23 ma. when the battery is fresh; the new power plant consists of five Mallory #502 mercury cells in series, and the data sheets showed they ought to give around 35 hours of use before they dropped to 4.5 V., at the new total current drain of around 95 ma. At this writing the boat has been run only a few hours with the latest setup, so we don't know how it will pan out.

No conclusions have been drawn yet, but there are some interesting points to consider. Firstly, as we all know, dry cells do not last indefinitely—they "consume themselves" when just sitting on the dealer's shelf, and the small ones go bad faster than the larger sizes. So unless you can decipher the code on the cells you use there is no way of knowing when they were made, and thus how

(Continued on page 67)

Maine Central R.R. ferry by Alan Warner, Brockton, Mass. Pittman powered. She weighs 10 lbs.; sports working anchor.



Jayro Restrepo R., youthful shop foreman for Lincoln-Mercury dealer in Medellin, Columbia, built model Chris-Craft runabout and Owens Flagship. He builds from U.S. kits and in plane field has Little Stinker performing nicely.



Two nice shots (above and below) of the model Owens by Jayro Restrepo R. Decal name on stern is "Hula-Hula Girl."



THIS CHRISTMAS...

DUMAS
MODELS
DELIVER
MORE!

MORE ENJOYMENT!

Modelers get a real thrill out of creating fast, flashy power boats from Dumas kits! As a Christmas gift for the hobbyist, or for pleasurable winter hours for yourself, Dumas models mean more enjoyment!



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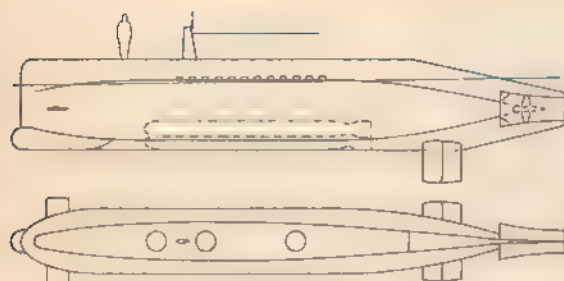
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Boat Design Competition

YOUNG MEN

FIRST
\$50
AWARD



Watch Dog, a hunter-killer pocket-size submarine by G. Truzzi of Padoca, Italy. Its special duty is to protect harbors and river mouths from enemy subs. Powered by an 85 hp diesel and 40 hp electric motor. Propeller operates in a venturi. "V"-shaped inverted control surfaces act as rudders and diving planes. Four homing torpedoes are carried outside of hull. Length 70 ft. Crew of four. Other equipment consists of snorkel, radar, sonar gear.

SECOND
\$25
AWARD

Class F Scow by Robert B. Donald of Severna Park, Md. The boat is designed especially for home building. Has eight ash or mahogany frames, covered with plywood. Mast is hollow, constructed of straight-grain spruce. Sails are Orlon or Nylon for greater durability. Boat has "hiking" seat to keep it from capsizing in stiff breeze. Under favorable condition speed is 14 knots.



THIRD
\$10
AWARD



Sport runabout by Dan Stowell of Hastings, Nebr. Has sea-sled type hull which is well known for its excellent stability characteristics. Powered by an 180 hp V-8 engine driving a single propeller through a Vee-drive. Carries six in two bench-type seats. Length overall is 18 ft. beam 7 ft. Top speed between 45 and 50 mph.

Rules governing this design competition are as follows: Profile (side), plan (deck) and (cross) sectional views of the proposed craft will be required, plus any detail sketches necessary to illustrate unusual features. Do not handicap yourself by submitting hull drawings less than 6 inches in overall length. Give sketches of craft from three-quarter front and rear positions. Photos of a model of the proposed design may be included. Information of powerplant(s), estimated performance, dimensions and explanations of

special features are required. Data as to age, occupation or schooling of the entrant should accompany each submission. Mail entries to Boat Design Competition, YOUNG MEN, 204 E. 45th St., New York 17, N. Y. Entry each month judged most practical or of greatest significance will receive \$50; \$25 will go to second place and \$10 for third. The editors regret they cannot enter into any correspondence or undertake to return any of the submissions, due to the large number received.



The CHERYLANN MODEL TUG BOAT

From the T-V Program "WATERFRONT"

Starring Preston Foster

ABSOLUTELY COMPLETE - Nothing to Buy Except Flashlight Batteries

This model kit consists of 92 separate pieces including 33 molded high impact styrene plastic pieces in three colors.

- Drilled brass rolling posts and wire railing
- Brass Stuffing box and propeller shaft with spring type universal joint.
- Rudder tube and shaft,
- 3 bottles of specially mixed paint.
- Ample Cement.
- Rotary switch,
- Plastic incased electric motor
- All screws and brass eyelets.
- Electric and rigging wire.
- Printed windows
- Detailed instructions and drawings
- Hull comes with white trim line and white names already applied.
- Name boards have white painted raised letters.
- Red and Green running lights are painted.
- Insignia and red stripe on stack included
- The Model is 20 inches long, 1/4 inch scale.

PRICE
KIT:

\$12.95

ASSEMBLED:

\$17.95



IF NO DEALER NEAR YOU
ORDER FROM ADDRESS BELOW.
SENT PREPAID

MEDLEY MFG. COMPANY 9300 E. FIRESTONE BLVD. DOWNEY, CALIFORNIA

(Continued from page 63)

WCMA are going to be as proud of these boys as we are."

While getting through college is the first big step toward electronic engineering, students should give some thought to going beyond a four-year degree. "Advanced degrees are becoming more and more important," says Dr. Fred C. Lindvall of Cal Tech. "The art of electronics has grown so fast that fellows have to do things that just can't be learned in just four years. More college is the logical outcome."

One of the pioneer radar companies, Gilfillan Bros., Inc., lists 20% of its total employees as engineers. Of this group, 16% have advanced degrees.

Electronics is no place to make barrels of money. It will, however, satisfy a creative urge at an excellent living wage. The high pay immediately out of college is thought by many to be an illusion. It takes ability, patience and tenacity to get to the top of this, as well as in any other profession. Those engineers who use the profession as an escape from reality seldom get above the \$600 or \$700 pay check. Those who go higher must know how to get along with people and have a knowledge of business as well.

"Actually the limits of our industry will be dictated by the qualitative and quantitative job we do in developing our young people," says H. Leslie Hoffman, "not only in the technical phase but in the production, management and financial phase as well. We must do this not only to develop our arsenal for peace but also our advanced thinking, our new ideas and our modern techniques into new products that will improve our standard of living and benefit our civilian economy."

Model Boating

(Continued from page 65)

old they are (moral here is always to buy dry cells from dealers who have large volume sales and move their stock rapidly). The hearing aid cells are just as bad, or even worse, in this respect as the normal pencils. The original set of eight pencils cost 56c (at a radio store), while the hearing aid pencils were about twice as much. At the same store, five of the #502 mercury cells cost about \$3. However, the latter have the great advantage that they lose very little of their capacity when not in use; we believe the loss is around 5% in a year. Furthermore, they do not need rest periods to recuperate, as do all dry cells, but will give about the same total life whether you use them in many short runs, or let your boat cruise for hours at a time. Five of the 502 mercury cells weigh about 5.25 oz., while the set of eight pencils of either type plus two holders weigh 6 oz.

Finally, an ideal power supply for a small boat like this would be a set of four type LR-1 Silvercells, which would weigh only 4.2 oz. and give at least 15 hours of operation on a single charge

Commercial Items. Those of you who like the looks of model boats described in construction articles in "YM" but hesitate to tackle them because you won't bother to enlarge the plans should not overlook the fact that full size plans for most of them are available from Hobby Helpers (770 Hunts Point Ave., New York 59, N. Y.). Send a dime for large catalog of all the plans and booklets put out by this concern.

As we predicted some time ago, the A-J Aircraft Co. (Portland 12, Ore.) is now selling Jim Walker's .065 Firecracker engine separately. It is ideal for R/C boats since it has a most efficient throttle arrangement built in, and plenty of pep to push quite a good sized craft. See this \$8.95 special engine at your hobby dealers!

Low cost marine drive kit now listed by Enterprise Model Aircraft Co. (Minneapolis, N. Y.) for only 75c complete. Consists of knurled and grooved flywheel, special bolt to hold same on engine, prop shaft and tubing, metal prop, etc.

Two new electric outboard motors listed by I. B. Wolfset Co. (27 E. 22 St., New York, N. Y.); Triumph is 5" high, has two-way swivel, and uses 3-9 V., retails for \$2.98. Wolf Cub is 5 1/2" high, has automatic starter, motor stand and accessories, retails at \$3.98. Both motors are of die-cast aluminum construction.

Two boats in new Olympia series have been introduced by Craft Models Inc. (754 Main St., Fitchburg, Mass.). Olympia Runabout is open style with covered foredeck and windshield, has 7" beam and is 18" long; kit includes assembled wood and plastic hull, chrome plated fittings, sells for \$4.95. Olympia Cabin Cruiser is on same hull but has large cabin and windshield atop, sells for \$5.95. Both boats are intended for either electric or glow outboards.

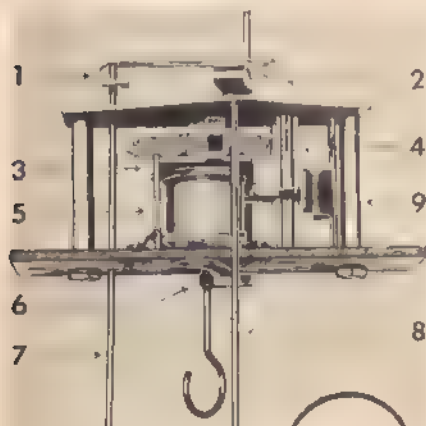
A finished plastic hull is feature of kit for Flash outboard racer, product of Lindberg Products Inc. (Skokie, Wis.). Boat is over 18" long, has 10 1/4" beam, and may be finished in short time by simply attaching a few pieces of metal hardware. Will take any model outboard engine now on market, and kit sells for \$2.98.

**MOST VERSATILE****MOST EFFICIENT • Lowest Price!**

Weight $\frac{3}{4}$ oz. • Width $2\frac{3}{8}$ in.

Exclusive features:

- Handles both $\frac{1}{4}$ " rubber for large models and $\frac{1}{8}$ " rubber for $\frac{1}{2}$ A jobs—ample power for any rudder application.
- Special coaxial magnetic circuit guarantees many times more efficiency than that of any other escapement.
- Cuts escapement battery weight in half, doubles battery life. Uses one pen cell.
- Elevator and rudder control linkage furnished with unit—no extra cost.
- Simplest to install. Torque rod bearings in frame insure automatic alignment.
- Rust-proof, corrosion-proof parts—particularly important on boats.
- Finest precision custom-quality, designed and made with typical Babcock skill!



\$7⁹⁵

ALL THIS FOR ONLY

(1) Rudder linkage and (2) Elevator linkage, both furnished. (3) High efficiency coaxial magnetic circuit. (4) Speed control pinion, most efficient lightweight control. (5) Mechanism mounted between plates for protection. (6) Positionable secondary escapement switch. (7) Rudder torque rod. (8) Elevator torque rod. (9) Rust-and-corrosion-proof parts for long-life performance.

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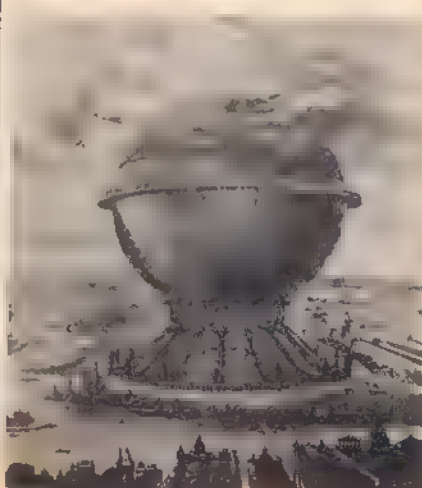
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TECH TOPICS



INVENTIONS AND IDEAS that jell usually get wide publicity, those that do not are quickly forgotten or buried in remote archives. Here are some ambitious dreams which failed to materialize. Top left shows a pneumatic elevated railroad proposed in 1872. The arches were to contain two tubes in which traveled cylindrical trains. Air under pressure was to drive the train like a piston. Top right: Elevated sidewalk (something New York could use right now), to bridge overcrowded streets and connect elevated railroads and ferry terminals were conceived in 1890. Too much objection from second-floor tenants? Lower left: New York has its Columbus Circle; Santo Domingo almost had a Columbus Sphere. This "monumental monument" to honor the discoverer of America was proposed in 1890, mostly to outdo the Eiffel Tower. The colossal sphere, measuring 1000 ft. in diameter mounted on a 262 ft. pedestal, was to be encircled by a 3280 ft. platform. Cost of \$6 million (no hay in those days) was a deterrent. Lower right: Ship-railroad across the Panama isthmus was proposed in 1884 by U. S. engineer James Buchanan Eads when it became evident that the Panama Canal project by the French engineer de Lesseps would not succeed. In 1904 U. S. bought the canal from the French and completed it in 1914, saving lot of rails, lumber and locomotives.

HARMON INTERNATIONAL TROPHY for world's outstanding aviator and aeronaut (lighter-than-air pilot) awarded this year to J. F. Skeets Coleman, Convair's engineering test pilot, for his flights in the XFY-1 "Pogo" VTO fighter; and Capt. Marion H. Eppes, USN, for piloting Goodyear Navy airship



ZPG-2 in simulated anti-submarine patrol during which the dirigible remained aloft for more than 8 days. . . . Pantobase, new word coined by Stroukoff Aircraft Corp. (formerly Chase) for airplane capable of operating from land, water, snow, ice or sand. Plane demonstrated for Army and Air Force was standard C-123 troop transport, converted for "all-base" operation by waterproofing fuselage and adding retractable hydro-skis. Plane took off from runway and landed in water from which it then became airborne in 30 seconds.

NATIONAL SOARING CONTEST, held this year in Elmira, N. Y., won by Britisher Cdr. Nick Goodhart of British Embassy, Washington, D.C. Second was Kemper Trager of Detroit, Mich., who was awarded U. S. National Championship title since Goodhart is not a U. S. citizen. The Stroukoff award of \$200 and trophy went to Steven Bennis of Linthicum Heights, Md., for his goal and return flight of 136 miles. . . . RAF getting delivery of four jet Vickers Valiant and Handley-Page Victor bombers. The Valiant, comparable in performance to the B-47, supposedly excels it in ceiling, being capable of operating at altitudes above 50,000 ft. . . . A late model jet fighter with afterburner can climb eight miles to intercept enemy bombers in the same time needed to drive a car around an average city block.

WASHINGTON announcement that U.S. is ready to launch a space satellite by 1958 opened floodgates of publicity, some of it giving impression that space travel has finally arrived. Actually the MOUSE (Minimum Orbital Unmanned Satellite) will be no more than 3 ft. in diameter,



equipped with telemetering equipment, launched to an altitude not higher than 500 miles. . . . Nowadays when anybody who knows a little about anything is called an "expert," Remmert-Werner of St. Louis, Mo. (they convert transport planes into plush corporation chariots) has a definition for the title: "X" stands for an unknown quantity, and everybody knows that a "spurt" is a drip under pressure. . . . Thunderstorm static which spoils radio programs being used by AF's Air Weather Service to map the meteorological disturbances. Picked up by a device known as "static direction finder," the "crackle" is videoed onto a screen on which it appears as spears of light showing direction from which the discharge came.

TEMCO AIRCRAFT CORP., Dallas, to build parts for Convair B-58 Hustler delta-wing bomber. . . . One of the major problems of future space ships will be providing air to its occupants. Such a ship must virtually carry its own atmosphere, air conditioning, purifying plants as well as complex circulation system. Because of absence of gravity, natural convection of air will not occur. Warm air will not rise to be replaced by cool air, as it does on earth. Man, confined to a small area such as the cabin of a space rocket, would soon be surrounded by deadly carbon dioxide from his own breathing, and eventually asphyxiate. Machinery would also be affected, heating up rapidly and breaking down. Forced circulation of air reaching into practically every corner of the ship will be absolutely essential.

WE FLY 740. Morane-Saulnier 740 "Paris," French four-place light jet transport, to be built under license by Beech Aircraft Co. for executive use, on tour of U.S. and Canada creating considerable excitement and interest. Low and sleek, it has exceptional visibility due to the large Plexiglas canopy and a cabin located well forward of the wings. Fight demonstration proved "Paris" everything Morane-Saulnier claims for it. Effortless in flight, maneuverable, exceptionally light and responsive on controls, it takes to the air as its natural medium. On take-off acceleration is rapid, not usual with jets, and climb out at a good rate possible as soon as airborne. Single-engine performance is very good, retrim is not necessary because of engine location close to fuselage centerline. Most surprising is the effect of dive brakes, which are in the shape of sailplane spoilers but located inboard of wing, close to the trailing edge. They do not induce a pitching moment and can be applied with hands and feet off controls. Deceleration is rapid and positive. The two Marbore II jet engines, rated at 880 lbs. of thrust each, are quite noisy from the outside. Turning up in excess of 20,000 rpm, they sound like high-pitch sirens; inside, though, the noise level is low, permitting conversation in normal tones. All in all a delightful machine, and Beech should be congratulated on taking the initiative in introducing the first civilian jet in this country. However, they have a tough row to hoe as tentative price is very high. Its brilliant performance may overcome this stumbling block, as the plane offers exceptionally fast transportation unobtainable in civilian airplanes of this size anywhere, cruising at speed equal or slightly over that of a DC-7.—Alex Dawydoff

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AIRCRAFT YEAR BOOK published by Lincoln Press, Inc., 1143 National Press Building, Washington, D. C. (472 pages—\$6.00) is the 36th annual edition compiled under the auspices of the Aircraft Industries Association.

As the name implies this is a once-a-year report on aviation's activities and accomplishments. The information is prepared from material given by the industry. This new edition has an expanded pictorial section and more three-view drawings than in recent years. Included is a chronological listing of aviation events from the early days. A complete run-down of the latest airborne weapons and guided missiles makes for hours of interesting study.

This compendium also provides a complete directory of the aircraft industry. It is an excellent guide book for an overall look at that industry.

GENTLEMEN, START YOUR ENGINES by Wilbur Shaw, (Coward-McCann, Inc., 210 Madison Ave., New York City, N. Y. 320 pages—\$5.00) is a book for all racing enthusiasts, from youthful hot-rodgers to men of any age.

For thirty-five years Wilbur Shaw had been a leader on the racing scene, living in the violent world of speed, seeing his close friends killed on the track and himself more than once coming out of seemingly fatal crack-ups with nothing but a few scratches.

In this volume the reader will experience the heartache of watching a beautiful racing car that has taken all the money which the sponsors could raise plus months of man-hours to put into sharp racing condition, take a few turns around the track and then completely break down. The constant theme is sportsmanship, the code of the drivers is always lend a helping hand, yet never to show a lessening desire to win.

Wilbur Shaw never let down. He learned how to fly, but his real love remained racing autos. In 1937, '39 and '40 he achieved his heart's desire: first place in the Indianapolis "500." He raised the money to put the Speedway back on its feet after the war years. Every year since the war the author gave the traditional Memorial Day command, "Gentlemen, start your engines." Last fall Wilbur failed to walk away from an airplane crash—he and his two companions were killed.

THE BIG BOOK of CARS, text by Felix Sutton and pictures by Tom Hill (Grosset and Dunlap, New York, N. Y. 24 pages—\$1.00) is a "Big Treasure Book" filled with information and authentic pictures of old and new cars of all types.

Starting with the first American gasoline-powered car built by Charles and Frank Duryea in 1893, the authors have covered the history of auto making in this country.

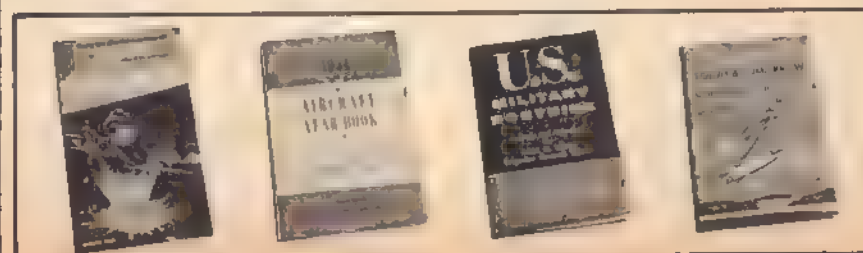
One section that will catch the reader's eye is the car assembly line with each sub-assembly labeled and the time it will take to go to final completion and the drive-off platform. In the Ford assembly, which is the one illustrated, the total time is 87 minutes.

This book is an ideal pictorial history of American cars for your younger brother. Bet you and Pop grab it away from him, though.

U.S. MILITARY DOCTRINE by Dale O. Smith, Brigadier General, U.S.A.F. (Little, Brown and Company, 34 Beacon St., Boston 6, Mass., 256 pages—\$3.50) gives a sound reason for our large military establishment of today: war cannot be successfully waged by amateurs no matter how patriotic and courageous; there must be unity in command of the military establishment to win a war.

The citizens of our new-born country were afraid of a standing army because of the unpleasant experience they had passed through in driving out the mercenaries the British used for internal control. Yet as our nation grew trouble with our neighbors arose and Congress was faced with the need of a strong military—yet afraid of it—cut it in two parts, the army and the navy, thus hoping by this "disunity" to prevent our country from ever coming under the control of the military. Not until warfare took to the air did we fully realize as citizens that boundaries such as shore lines were erased and the need for a unified military command arose. With this unity in the military a necessity for a sound national policy has come about.

For the reader who is interested in a military career or who will soon serve in the armed forces, this book is very important. The author, a general officer in the Air Force, has written with fairness to all services, although he does not overlook the tremendous influence air power has had on our troubled world.



FLIGHT, TODAY and TOMORROW by Margaret O. Hyde (Whittlesey House, McGraw-Hill Book Company, Inc., New York, N. Y., 140 pages—\$2.50) is an up-to-date introduction to flying.

The author explains with simplified sketches the principles of flight from take-off to landing. All types of aircraft are described; their effect on our way of life is discussed. While reading this book one gets the feeling of flight and learns the problems of piloting.

This volume is of particular interest to the junior aviation enthusiast because of the many aircraft illustrated—drawings and diagrams are found on almost every page.

THE DAM BUSTERS by Paul Brickhill (Ballantine Books, 404 Fifth Avenue, New York 18, N. Y., 185 pages—\$0.35 paperbound, \$2.00 hardbound edition) is a true story of World War II's most significant bombing mission.

The purpose for the formation of Squadron 617 was the destruction of the dams providing hydro-electric power to the German heartland—the Ruhr. The story starts with a British engineer who calculates the effect of the destruction of the Mochne and Eder Dams in Germany. This project needed a bigger bomb, then a bigger plane to carry the new weapon, and since it must be dropped from extremely high altitudes a new and more accurate means of bomb sighting. At first the scheme was considered preposterous, but after considerable red tape was chopped away the mission was finally accomplished although at a high cost in men and aircraft.

Because of the success of this new pinpoint bombing method the squadron was assigned the destruction of the V-2 Rocket sites, the U-boat pens and finally the battleship Tirpitz in a Norwegian fjord.

Here is a book of high adventure, true in all its detail; once the reader starts he'll not lay it down until the last page has been turned.

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Not all Air Force bases have taken the names of pilots or other military figures. Chanute Field was named in honor of the early aeronaut, Octave Chanute. Born in Paris, France, Chanute came to America at the age of 6 in 1838. He secured a position with the Hudson River Railroad at the age of 17 and became proficient in many phases of engineering during his spare hours. While yet a young man, he gained world renown as a civil engineer, architect, designer and builder of great bridges. He pioneered the discovery of the chemical method currently used for preserving railroad ties. At the age of sixty, Chanute became interested in the almost unheard of "science of aeronautics," building a number of successful gliders. He also acted as counsellor and adviser to the Wright brothers in their early experiments with flight. His system of controlling the lateral stability of aircraft by changing the angle of the wing and its center of pressure accordingly, is but one of the principles embodied in present-day aircraft which Chanute was the first to note. . . . Chanute Field was officially opened on July 31, 1917, and is among the permanent Air Force installations in use today.

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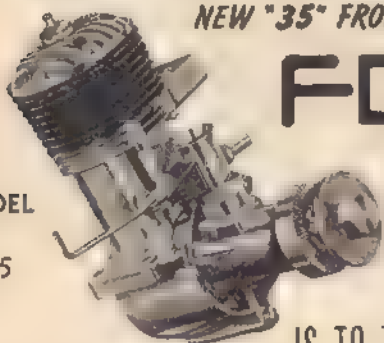
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JOIN A "JETS" CLUB! If you belong to a model plane, boat, or car club you know from experience that it's much more fun—and more profitable—to be a member of a group with similar interests than a lone wolf. (Sure, the same applies to Mom's sewing club too, but let's be practical). Suppose you want to be an engineer? Then join an engineering club, right in your high school! Meaning one wherein you can turn out interesting projects, see engineering movies, go on field trips, get scholarships, meet with practicing engineers, and generally have an interesting time with other fellows planning to enter that certain field. If you haven't heard of JETS clubs and want to join this well-organized, growing movement, read on.

The initials JETS stand for Junior Engineering Training for Schools, a pro-

gram started and fostered by Michigan State University (formerly College) to stimulate and assist high school students in training for an engineering career. Originally begun for youth in the State of Michigan, this "4-H club of engineering" program now has 59 clubs in 10 States, with a total active membership of more than 1500. The doings of the individual clubs are their own, but the Headquarters group on the Michigan State campus stands ready to offer advice, methods and procedures—including ways that clubs can get together with others in competition for prizes for best projects. The parent organization awards cash scholarships to top men in individual clubs, but in addition its impressive library of information has a number of items on scholarship information.

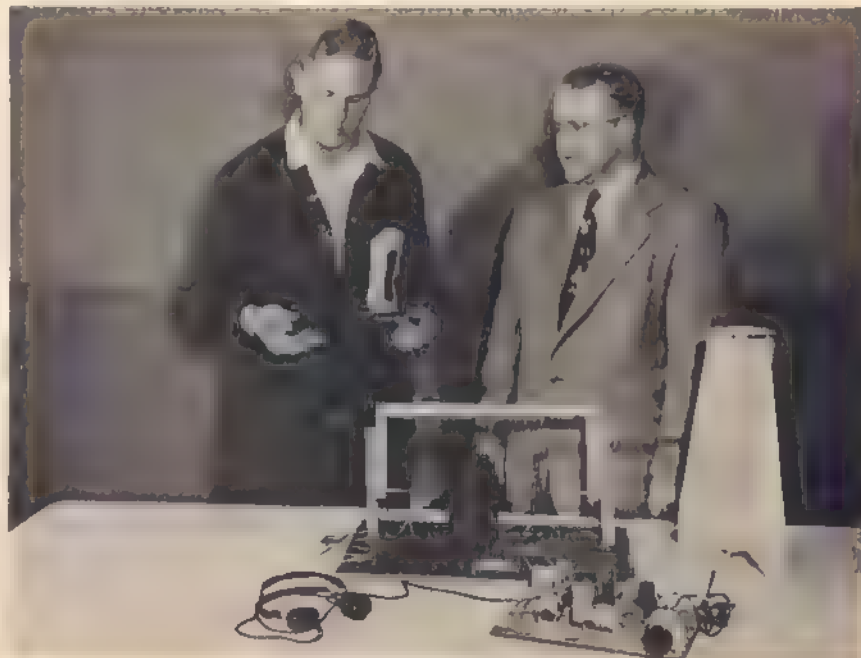
This "library" at Headquarters contains 416 items all available to all JETS Clubs—such as lists of movies and Kodachrome slides you can send for, pamphlets and booklets on engineering obtainable from General Motors, Dupont and other companies, organizational material prepared by JETS.

The projects you undertake may be either individual or club in nature—87 have been prepared in outline just to get your idea factory in production. In the past few years club members have won recognition with an electronically controlled model pile driver, a model of a solar-heated house, Geiger counter and transistor radio, model rocket plane,

etc. Remember, it pays to think up and construct projects for any of the several large national science-based competitions sponsored by industry each year. But don't forget that in also affiliating with an outfit like JETS, you are a member of a fraternal organization with a wide range of other activities, and can draw upon expert assistance in the matter of what to do.

All JETS Clubs are extra-curricular, run entirely by its members, and meet outside of school hours. If you would

like to start one in your school, enlist at least three other fellows and approach some member of the faculty who would agree to act as "Jet-Pilot" (advisor). (A teacher in math or science, or mechanical drawing or shop). Have him write for introductory literature on JETS, including the "Pilot's Handbook," which contains full information on getting a club under way and how to conduct it. Address: JETS, P.O. Box 470, East Lansing, Mich. Or write to Headquarters yourself. (Cont. on next page)



Layton Miller holds jet engine he built as member of Olivet (Mich.) JETS Club. Foreground: other projects. Science teacher Gordon McAllen (left) is adviser.

This beautiful model car is only one of the hundreds of award-winning entries in last year's Fisher Body Craftsman's Guild Competition

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model railroading than almost any other form of publicity. It must be a satisfaction to your customers to receive a catalog in which they can find every last item that they could possibly need to build or improve their layout; and further, I am sure that they find a great many things they never realized were on the market. You can take great pride in a job well done, and I am sure every manufacturer will appreciate your efforts in furthering the hobby.

"Again, congratulations on a fine piece of work in your latest catalog. You always do

a wonderful job, but this is GREAT. We wish that we had many more dealers like you, but know that YOU will not agree with us on that. Best Wishes."

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(Continued from page 73)

SCHOLARSHIP BULLETIN. Seniors! Now is the time to start those wheels turning in regard to scholarships if you plan to enter college next fall. There are applications to fill and submit, letters from principals and sponsors to collect, arrangements to be made for taking College Board tests in most cases—all kinds of preliminaries that require time and are bound up with deadlines. For instance, this year again AMVETS is offering \$2,000 four-year scholarships at any accredited college to sons (and daughters) of deceased or totally disabled vets of World War II or Korean conflict—and you must send the necessary filled-in forms by March 1, 1956. If interested and eligible, contact your nearest

AMVET Post now for an application blank, or write David F. Schlothauer, AMVETS National Service Foundation, P.O. Box 6038, Mid-City Station, Washington 5, D.C. (There are usually six of these scholarships awarded).

Interested in food? (As a career, Chub; not in making it disappear). The H. J. Heinz Co., through the National Restaurant Association, has on tap a \$1,000 scholarship for high school seniors good at any accredited college or university offering a four-year course in Food Service Administration. Applications must be received by February 1. For an application form, write to Miss Kathryn Bruce, National Restaurant Association, 8 South Michigan Ave., Chicago 3, Ill.

Do you live in one of the following

States: California, Oregon, Washington, Idaho, Montana, North Dakota, Minnesota, Wisconsin, or Illinois? A large motor transportation company serving the Northwest between Chicago and the Pacific Coast awards a minimum of 10 \$500 scholarships to outstanding seniors residing in the States named, for attendance (one year) at any accredited college or university located in said States. The deadline here is February 1. Address your request for blanks to Scholarship Committee, Consolidated Freightways, Inc., P.O. Box 3618, Portland 8, Ore.

ROCKET & GUIDED MISSILE STUDY. Don't think the country's schools aren't becoming increasingly aware of the importance of "reaction propulsion" as a part of their curricula! If you hope to specialize in the field of rockets, guided missiles and the like, you will find many of the leading colleges and universities that teach aeronautical engineering are including propulsion subjects. Notre Dame offers a propulsion option (major). California Institute of Technology, in addition to its regular department of aero engineering, now has a department of jet propulsion. Penn State and M.I.T., under A.E., have courses in guided missiles. Among other schools with curricula in aeronautical engineering which have added instruction in propulsion systems or aircraft powerplants (rockets included) are the Universities of Illinois, Colorado, Florida, Maryland, Michigan, Texas; Polytechnic Institute of Brooklyn, Rensselaer Poly. Inst., Ohio State, Municipal Univ. of Wichita, A & M College of Tex., New York Univ., and Princeton.

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CALENDAR of HOBBY MODEL MEETS and SHOWS

List your hobby club's public shows, exhibitions and contests here! There's no charge. Advise "YM" not less than 90 days in advance. Give telephone of contact man if possible. Send to "Calendar," c/o YOUNG MEN, 304 E. 45th St., New York 17, N. Y.

Address of contact man is in the same city as site of event unless otherwise specified. This publication does not assume responsibility for any errors in listing.

OHIO—Cleveland, Oct. 1-9. "The Cleveland Press" Do-It-Yourself Hobby and Photo Show. Cleveland Public Hall. "The Cleveland Press", 1420 E. 9th St.

TEXAS—Ft. Worth, Oct. 9. Cowtown Sahibs air-model record trials. Ralph Tenny, 608 W. Prairie, Arlington.

CALIF—Arcadia, Oct. 9. Air-model team racing. Les McBryer, 1238½ S. 2nd St., Alhambra.

M. J.—Bridgeton, Oct. 9. BMAC air-model meet. C. H. Erickson, 31 Walnut St.

PA—Perkasie, Oct. 9. Bucks Federation R/C air-model meet. Frank Horn, 411 E. Newton Rd., Hatboro.

CALIF—Riverside, Oct. 9. Air-model free flight meet. F. L. Swaney, 527 E. 55th St., Long Beach 5.

IND—Anderson, Oct. 9. AMRCA Indiana Jubilee model car race. Bill Cronin, 521 N. Jefferson St., Hartford City.

WASH—Seattle, Oct. 9. IMPBA model boat race. E. W. Drouillard, 141 N. 85th St.

CALIF—Baillio, Oct. 8-9. Modesto Aerial Robots air-model meet at Turlock Municipal Airport, W. E. Fischer, 543 Castle St., Modesto.

MICH—Detroit, Oct. 9. AMRCA model car race. Glen Fairabend, 20242 Russell St.

MASS—Boston, Oct. 9. Boston Model rally for planes. Lee Renaud, 220 Hyde Park Ave.

N. Y.—Flushing, NYC, Oct. 9. IMPBA model boat race. Kissena Park. Robert Graham, 127 Cottage St., Jersey City, N. J.

CALIF—Santa Ynez, Oct. 16. Annual FAI air-model meet. W. J. Knapp, Jr., 2733 Verde Vista Dr., Santa Barbara.

M. J.—Lakehurst, Oct. 16. Indoor air-model record trials. A. J. Becker, 2212 Griffith St., Phila., Pa.

OHIO—Akron, Oct. 23. AMRCA model car race. Guy Richards, 3353 Magaore Rd., Magadore.

WASH—Seattle, Oct. 30. IMPBA model boat race. E. P. Turrella, 14811 S.E. 42nd St., Bellevue.

CALIF—Fresno, Oct. 30. FGMC air-model record trials. Jim Scheidt, 2225 Brown Ave.

CALIF—Inglewood, Nov. 2. Skywolves air-model record trials. D. C. Crystal, 805 E. Palmer Ave., Compton.

TEXAS—Dallas, Nov. 6. Cliff MC air-model meet. J. B. Hargis, 1102 W. Saner Ave.

KAN—Wichita, Nov. 6. Wichihawks air-model record trials. J. P. Valle, 3891 E. Bruce.

IND—Indianapolis, Nov. 12-20. Do-It-Yourself Hobby Show at State Fair Grounds. Box 6089.

TEXAS—Ft. Worth, Nov. 13. Cowtown Sahibs air-model record trials. Ralph Tenny, 608 W. Prairie, Arlington.

CALIF—Inglewood, Nov. 13. Skywolves air-model team race. D. C. Crystal, 805 E. Palmer Ave., Compton.

CALIF—Fresno, Nov. 27. FGMC air model record trials. Jim Scheidt, 2225 Brown Ave.

FLA—Miami, Dec. 30-Jan. 2. Second King Orange Internationals air-model meet. C. R. Quick, 1896 N.W. 36th St.

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HEAT PROOF

BLUE RIBBON



K&O Popularizes Scale D.C. Outboards

Careful selection of the batteries gives long runs at comparatively low cost

■ The electric outboards made in Japan and imported by K&O products are the only actual scale working models of outboard motors available to the model builder. They are patterned after the famous Johnson Sea Horse (illustrated) and the equally famous Evinrude Aqua-sonic.

Both miniature replicas are of identical mechanical design, overall size and weight and operate on 3 to 6 volts. They are precisely scaled and even include the authentic trademarks and paint jobs of their big brothers.

The permanent magnet type electric motor is housed in an aluminum case. It is therefore not affected by heat which means it will not warp or soften should the need arise for resoldering a loose connection (this being the only mishap encountered in the rather severe tests to which these motors were subjected).

The armature is made up of seven laminations and is wound to produce a three-pole armature. Insulating facings are fitted to each end to prevent wire chafing. The commutator consists of three copper segments mounted on an insulating sleeve and held in place by two insulating collars. The diameter of the commutator is approximately ⅜" which means it has a low surface speed, thus contributing to low friction and a minimum of brush wear. Brushes are narrow strips of phosphor bronze mounted to an insulating base which also forms one of the shaft bearings. A brass plate of approximately 3/64" thickness held to the aluminum case by four tabs serves the two-fold purpose of

motor mounting bracket and bearing block.

Commutator and brush wear was negligible after six hours of continuous running. The commutator appeared to be only highly polished; the brushes showed only the slightest amount of burning.

To check the free running speed of the motor itself it was disconnected from the drive shaft. On six volts it revved up to 12,000 rpm, drawing 1.2 amps. When stalled it draws 4 amps. From the results of this test we strongly advise against stopping the propeller by hand to check power, for this show of bravado will definitely run the batteries down in very short order. Free running speed with the outboard completely assembled but not under load and operating on 6 volts was 5,500 rpm.

Power take-off to the propeller is by means of a 3/32" diameter shaft. A brass universal is used as a coupling between the drive shaft and the armature shaft. A set of brass 1.25 to 1 reduction gears complete the drive to the propeller shaft.

An aluminum gland threads into the gear housing to keep water out and to form the bearing for the propeller shaft. The three bladed 1¼" diameter propeller is chromium plated and threads to the shaft. It is held securely in place by a locking nut which is tightened against it.

If you remove the propeller for any reason, it is important that you do not thread this nut rearward against the gland as it will bind the shaft. The space of a business card is about the proper



clearance to maintain between these parts.

The main casting features a transom clamp that is adjustable both for turns and for angular changes of the propeller. Normally the weight of the motor holds it against the transom clamp with the propeller at zero degrees. However, if it becomes necessary to raise the bow of the model to improve its running or planing angle, shims can be cemented to the horizontal bar of the clamp to give the propeller the needed negative angle. This swiveling transom clamp offers the added protection of swinging up should the model run aground.

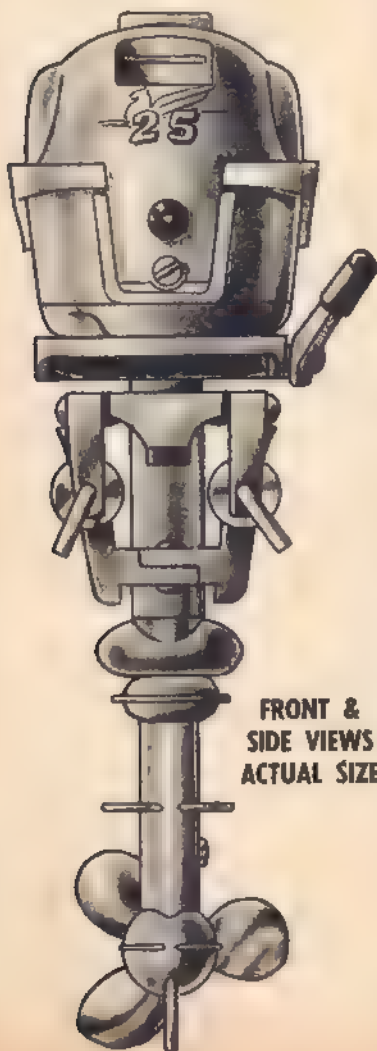
A built-in knife-type on-off switch is another feature of these outboards. It is conveniently located on the right side of the motor cover viewed from rear.

Although the manufacturer recommends using regular size flashlight cells, running tests were conducted to report the maximum continuous running time under load when using readily available batteries of various sizes applicable to model boat use.

Bear in mind that in actual usage the life of the batteries will be greatly extended if short runs are made and the batteries allowed to rest between runs.

For all practical purposes running time remained the same for a given size of battery whether 3 volts or 6 volts were used. On four pencils maximum running time was 20 minutes. Running on four medium size "C" cells 90 minutes; on four regular size "D" cells 105 minutes. All cells were wired in series to give 6

(Continued on page 89)



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SIDE VIEWS
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CUSTOM RECEIVER



SIGMA RELAY



CUSTOM TRANSMITTER BOX INCLUDED



ALL THREE

RECEIVER TUBE "IDLES" WHILE RELAY REMAINS IN UNENERGIZED STATE. (saves tube and battery)

TUBE CURRENT INCREASES and RELAY BECOMES ENERGIZED ONLY WHEN TRANSMITTER IS KEYS

SHOULD RECEIVER or TRANSMITTER FAIL WHILE IN USE MODEL COMES IN RATHER THAN FLYING OUT OF SIGHT (This new type of "Fail Safe" operation fully explained in our instructions)

Fully Re-Designed "CUSTOM RECEIVER" weight under 3 ounces including 10,000 ohm relay (relay included), plus Silver Ceramic Trimmer, midge resistors & condensers, Nylon Coat Coil wire etc. Uses one X F G 1 Tube which IDLES while relay not energized saving Tubes life, Batteries etc. "CUSTOM TRANSMITTER" 27 M C Exam. Free Band with pre drilled base etc. Transmitter box only 4 1/4" x 5 1/4" (Box included may be hand held or placed on Field. Has range of 1 mile or more. Full Drawings and instructions included "CUSTOM ACTUATOR" of new magnetic principle operates both rudder and elevators or rudder alone off battery supply no rubber used for Balsa, Aircraft, or Cars of small to A size up to large 8 ft. models. You do not have to be a Radio Expert to assemble the 3 units, all parts are tagged and marked to correspond to drawings.

"CUSTOM MIDGET" RECEIVER TRANSMITTER and ACTUATOR . . . \$9.98 ☐

Also Available "STANDARD MIDGET I" Radio kit, this group of 3 units, same design as above, same Relay, Same type Transmitter and Actuator. The difference from above is the Receiver weight which is greater (slightly over 4 ounces) Heavier components used.

"STANDARD MIDGET I" RECEIVER TRANSMITTER and ACTUATOR. \$6.98 ☐

PLANS FOR THE "CUSTOM MIDGET" all three units 50c ☐

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"SUPPLY SOURCE DIRECTORY" Tells where to obtain Relays, Tubes, Crystals, all types equipment low as 1/20th normal prices. \$7.00 MERCHANDISE COUPON FREE with Directory
"SPECIAL 10 FOOT TRANSMITTER AERIAL" \$1.00 ☐ **SPECIAL 10,000 OHM SIGMA RELAY** \$2.98 ☐
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RADIO-TROL

**COMBINATION TRANSMITTER & RE-
RECEIVER BASIC PARTS KIT.** A low
cost high quality package deal to build
the famous "MAG 11" KMTR. Deluxe
kit includes wound coils, drilled chassis
& 2 tubes.

Crystal—antenna—case only extras re-
quired.

LOOSE RECIPIENT

Receiver kit includes all highest quality
components required for R/C's most re-
liable & popular receiver. With wound
coils, drilled base, pot & cable jack &
plug. Less tubes

The price is unbelievable, only . . . \$9.95
With new half oz. 5000 ohm relay 13.95

**DO NOT CONFUSE THIS SUPER
PACKAGE DEAL WITH INFERIOR
80 CALLED "BARGAIN PACK-
AGES."**

STOP SPENDING MONEY on "B" bat-
teries for your KMTR. Use our mini-
ature size 2 volt vibrator power supply,
delivers 135 to 180 volts under 40 ma.
load, all new material, do not confuse
this item with units using war surplus
components, which are not rated as
above. Assembled, wired, tested . . . \$9.95
Kit . . . 6.95

USE PROPORTIONAL CONTROL in your
next model, build the **RADTROL WAG
Pulsar**, all high grade components, in-
cludes **ALLEN BRADLEY 1 meg pot.**
and tubes. Kit . . . 6.95

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HOBBY

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with famous C-Lect-Choke for \$32.95
(\$1 more west of Rockies). You change
pattern instantly by "dialing" the choke
you want. Mossberg has a big free cata-
log. No sales are made from factory;
you can see this Mossberg and its com-
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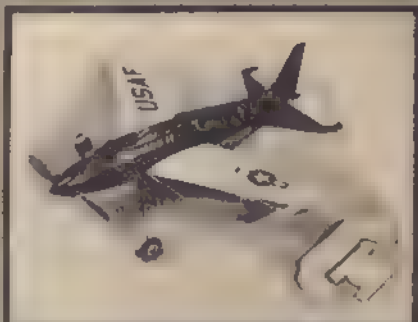
Newly designed **Pony 135 Camera
Outfit** features Kodak Pony 135 Model
C camera, field case, Kodak Standard
Flashholder and Clip-On flashguard. This
budget-priced miniature gets color slides
or black-and-white snapshots with equal
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with speeds to 1/300 second. Case is
dark mahogany leather with plush lin-
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ended device for loosening or tightening
glow plugs and removing cylinders —
without damage, emphasizes Bob Hol-
land. Accurately engineered to fit most
engines. Smart to keep such an aid right
there in your tool box at all times.
Priced at 25c. Like so many other little
tools it's a small investment that can
repay you many times.



The **Junior Sales Club of America**
(Springfield 1, Mass.) is featuring this
Comet Sabre 44 model among the many
prizes offered to its members. JSCA'ers
sell Christmas card assortments and are
awarded a wide variety of nationally
advertised products in hobby and sports
field: R/C equipment, model boat kits,
rifles, bicycles, camera outfits, football
equipment. Write for free booklet.

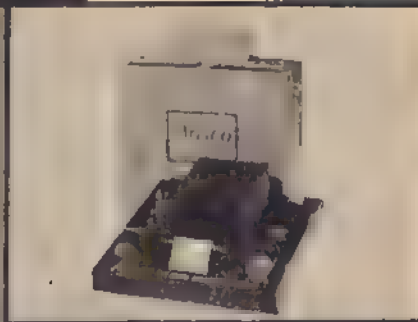


Something new in spinners is what
Merco (Mercury Model Airplane Com-
pany) is talking about these days. They
offer five sizes in their new hi-impact
(that means they're tough) needle nose
and regular plastic spinners. Also you
get a choice of red, blue, black, silver
or yellow to go with any model color.
In bad crash plastic should serve to
cushion crankshaft to some degree.



SHOWCASE

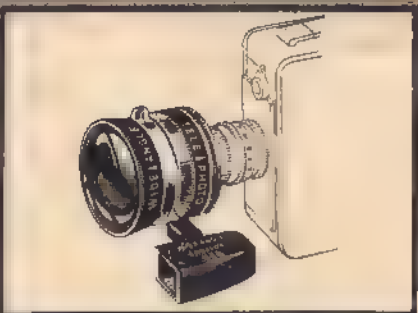
Another version of Ansco's 2A Home Developing Outfit now available. Differs from previous model primarily in greatly improved packaging which gives maximum storage convenience with minimum storage space, while serving admirably for vacation trips: when closed, can be carried like small suitcase. \$9.75; has all-metal printer and all essentials for home darkroom work.



Biggest boat in the Dumas line is the 35-inch model of Chris-Craft's 35-foot Sport Fisherman. Suitable for radio control, the Sport Fisherman takes twin electric or gas powerplants. Parts are die-cut. Kit sells for \$13.95 and a special metal fittings set of 48 pieces is available, \$5.50. New catalog for 10c from Dumas Products, 2114 S. Alvernon Way, Box 6096, Tucson, Ariz.



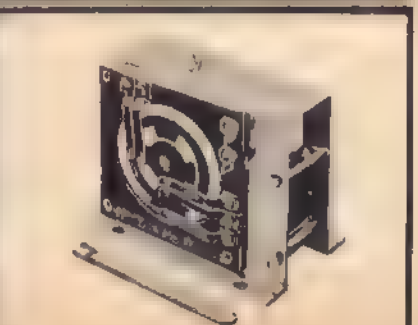
Revolutionary new movie camera lens, the "Dual-Lens" comes from EdnaLite Optical Co., Peekskill, N.Y. Device enables an 8-mm movie camera user to take telephoto and wide-angle movies with one reversible lens. In one position, Dual-Lens produces wide-angle movies; by simply turning lens over, you can shoot telephoto movies. No light compensation required. \$24.95 with case.



Of interest to modelers and especially model boatmen is Polk's Model Craft Hobbies Aristo #5 electric motor. Specifications: rpm, from 1,250 to 1,500; amperage, 250 to 300 m.a.; armature dia., 32 mm; horse power, 1/20th; working voltages, 3 to 12 (six usually found economical and ample); number of poles, 2; shaft dia., 2.8 mm; net weight, 258 grams (slightly over half a pound).



Electric motor speed control and sequence reversing relay is all yours in this Babcock Radio Engineering unit. You get start, stop, reverse, and 2 speeds forward. For battery-operated boats, cars, trucks and other R/C uses. Hooks up to a single or multi-channel receiver or to a Babcock super compound escapement. Xmtr signals move contact wheel as fast as operator desires. \$12.95.



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Refrigerate
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WRITE HIS NAME
IN THE CENTER
OF A SHEET OF
PAPER ...



-THEN, ANOTHER
NAME ABOVE IT...



AND FINALLY,
ONE BELOW...



TEAR THE NAMES APART
...TOSS 'EM INTO A HAT AND
TELL YOUR FRIEND, YOU CAN
FIND HIS, WHILE YOU ARE
BLINDFOLDED!



SKEETER CURRY
OF GREENWOOD S.C.
SEZ IT'S EASY... YOUR
FRIEND'S NAME WAS
IN THE MIDDLE, IT'S
THE **ONLY** PIECE OF
PAPER WITH **TWO**
ROUGH EDGES!!



PRACTICE THIS ONE BEFORE A MIRROR A FEW
TIMES AND YOU'LL FOOL EVERYONE!



SHOW THE
TOP CARD...
OF A FULL
DECK ...



PASS YOUR
HAND ACROSS
DECK **THIS**
WAY - NOTHING
HAPPENS



BUT PASS YOUR
HAND DOWN &
THE CARD
CHANGES!



NOW, SHOW
THEM THAT
THERE IS NO
CARD IN THE
OTHER HAND.

HERE'S HOW:



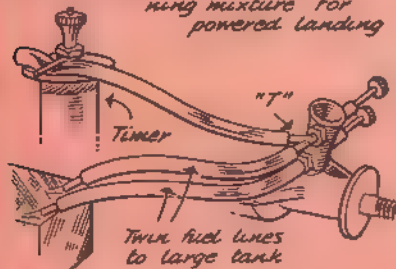
MIAMI, FLA.

ON THE FIRST 'PASS' (FIG. 2)
YOUR FOREFINGER PUSHES
THE BOTTOM (BACK) CARD IN-
TO THE PALM OF RIGHT HAND.
THEN COVER THE DECK AGAIN
& LEAVE THE NEW CARD ON TOP
AS YOU START THE DOWNWARD
PASS SHOWN IN FIG. 3

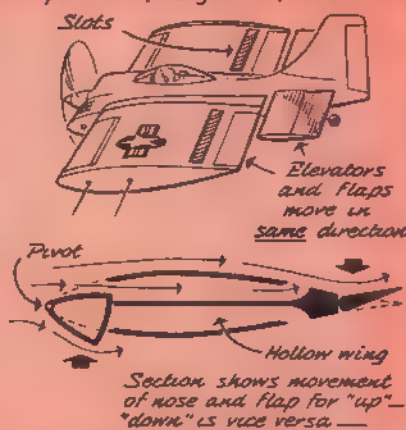
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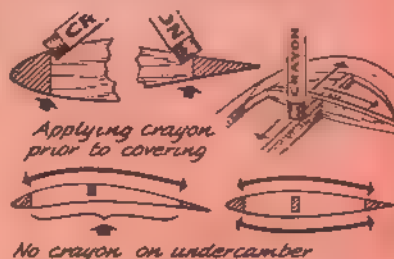
Use of timer with 2-speed carburetor allows repeated, timed flights from large tank without refueling suggests Roy Reagan, Eagle Point, Oregon. Fine for R/C or control-line. Timer cuts air flow, starts rich, slow running mixture for powered landing.



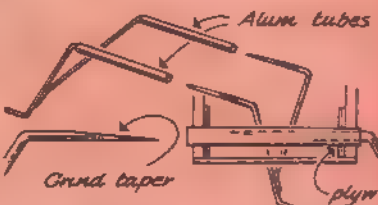
Span = 30", Length = 16", 8" chord



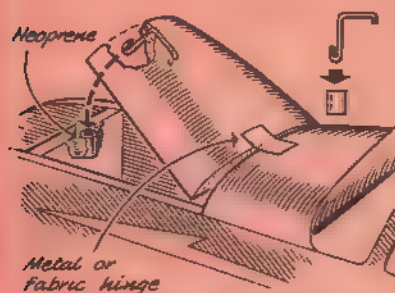
Radical idea by Charles Taylor, Belle Plaine, Minn., is full of innovations. Hinged nose sections, hollow wings, flaps working with elevators (both go "up" together), plus close-coupled design makes for top maneuverability. Model has .045 Spitzy - has wheel brakes.



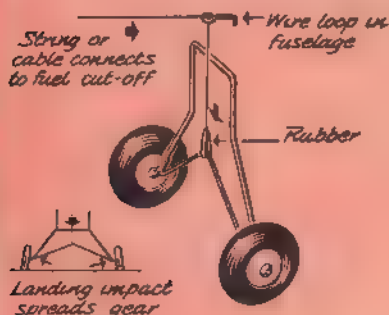
Wax crayon, rubbed on parts of model framework prior to applying silkspan or silk covering, prevents dope pulling the material in along edges of frames. Sylvan Wolverton, Columbus, Ohio, says this technique permits more uniform shrinking, smoother finishes.



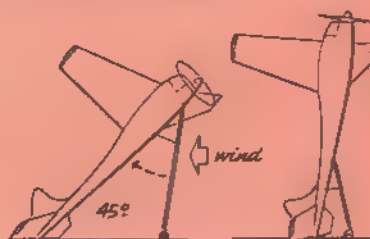
Geoffrey Pike, British modeler, builds "plug in" gear to facilitate transporting model. Gear wires are ground to overlap in tubes, are held in place by friction.



Latch for door or hatch can be made from length of neoprene tubing and wire part, bent from pin or paper clip. Loop in end of wire expands tube, holds door or hatch closed snugly. Used by Jerry Peck, San Diego, Calif.



Clever engine cut-off system rigged by Larry Foster, Fulton, Ky., utilizes outward flex of landing gear to trigger fuel cut-off. Idea suited to scale, stunt and control-line team racers. Rubber loop gives flexibility for setting cut-off.



From "Salt Flat Sentinel," edited by Hal Yeager, Salt Lake City, U.C., is tip on VTO. In wind, 45° angle is recommended, nearly vertical attitude for little or no wind. Use small wheel on strut end to meet A.M.A. rules retract strut by clock spring or rubber band.

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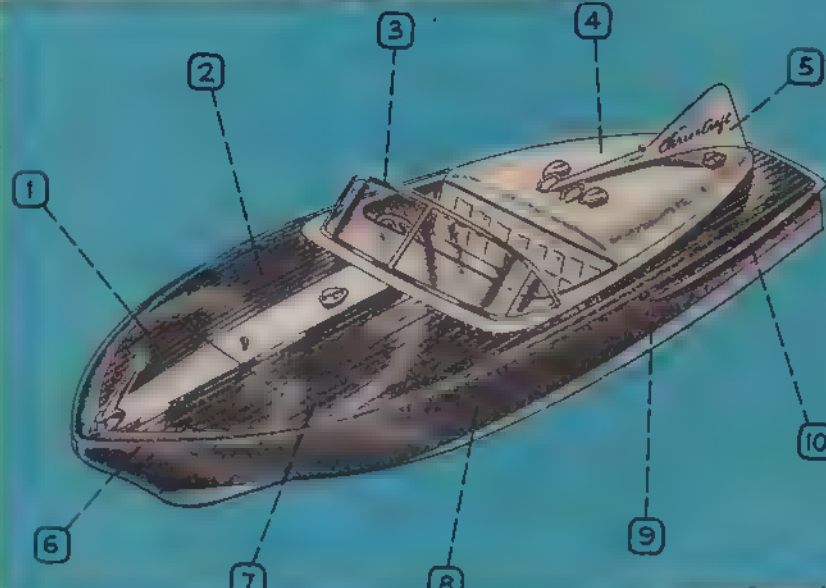


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BERKELEY'S "COBRA"



■ Berkeley Model Supplies' 31.5 inch long copy of the Chris-Craft "Cobra" is something to gladden the heart of any model boat fan. Scaled 1.5 inches to the foot, engine compartment is completely separated from the optional radio control gear.

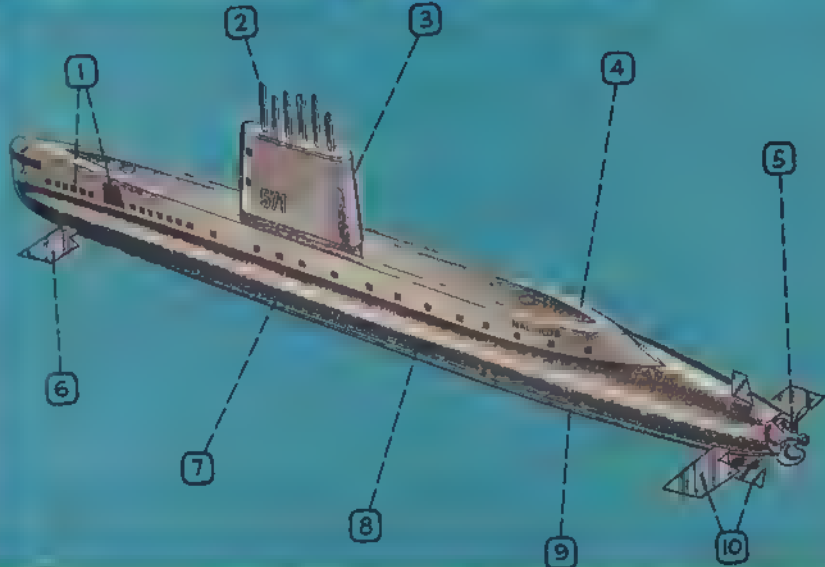
Highlights of the kit: 1) die-cut, grooved mahogany veneer decking; 2) radio control access hatch; 3) die-cut celluloid windshield; 4) built-up balsa aft deck; 5) die-cut balsa fin; 6) die-cut mahogany veneer corner strips; 7) die-cut plywood and balsa formers and bulkheads; 8) die-cut mahogany veneer sides, bottom and doublers; 9) provision for .049—.35 cu. in. gas engines or electric motors; 10) Laminated veneer rails.



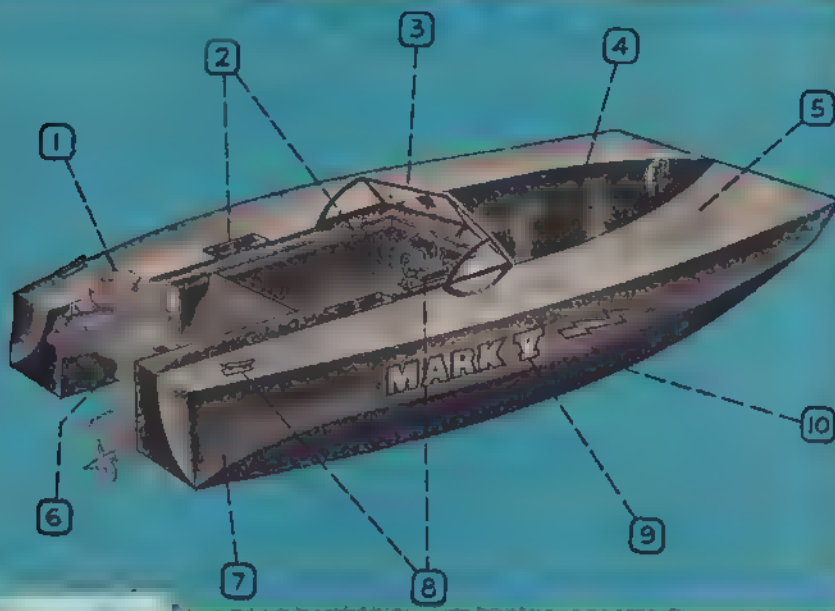
■ Scientific Model Airplane Company really takes off—under water!—with its operating submarine scale model which submerges, surfaces, then cruises like the genuine article. 18" hull.

Features to be noted: 1) decal ports, hatches; 2) die-cut balsa periscopes, masts, etc.; 3) formed balsa conning tower; 4) data and decals furnished for authentic finishing; 5) molded plastic, three-blade propeller, nose button and winding crank; 6) die-cut aluminum forward diving plane; 7) fully shaped, hollowed balsa hull; 8) T-56 rubber motor and wire fittings supplied; 9) die-cut bottom sheets with data for ballasting; 10) die-cut aluminum rear planes, rudders.

SCIENTIFIC'S "NAUTILUS"



AQUA'S "AQUA ACTION"



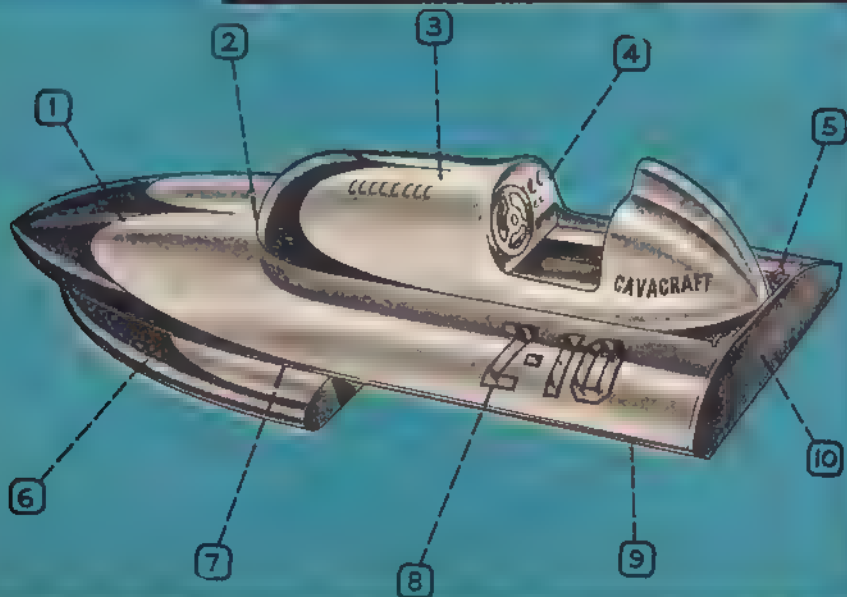
California's Aqua Products (a division of Model Engineering Works) is responsible for this racing boat kit, especially designed for speed runs.

Here's what you see when you examine the kit: 1) miniature gasoline inboard or outboard engines recommended; 2) plastic steps, throttle, bow light and tether lugs; 3) black and clear plastic foursection windshield; 4) all formers, keel and sides of die-cut balsa; 5) lead bow weights supplied; 6) recessed, die-cut pine transom; 7) sheet balsa body covering; 8) cast metal cleats, wheel, fire extinguisher; 9) black and gold decal insignia; 10) plastic hull fin included.

Especially designed for .049 engines, either the inboard-outboard type or straight inboards, Cavacraft's "Trophy Racer" is modeled right from the full size craft. The length is 14" and beam is 7 3/4".

Noteworthy points include: 1) shaped balsa hull; 2) recess fitted to receive superstructure; 3) formed plastic superstructure assembly; 4) die-cut plywood wheel, motor mount for inboard gas powerplant; 5) hold-down fittings for removable superstructure; 6) fully shaped balsa sponsons; 7) die-cut plywood bottom; 8) racing decal numerals; 9) data for carving "non-trip chine"; 10) die-cut plywood stern.

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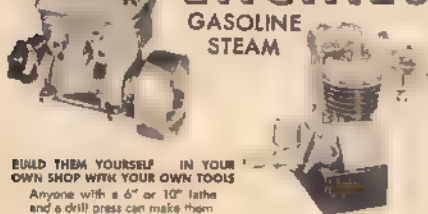
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Under Control

(Continued from page 61)

the armature; pin on the Kurman armature goes in one slot, with a single screw in the other to hold the new core and coil. Dick says there are five R/C'ers in Mt. Vernon, all of them beginners except Ted Strader, and activity is enthusiastic if not very expert. Dick is a converted U/C flier, says he used to scoff at the free-flight boys, but does so no longer, since he tried to trim a few radio planes.

Commercial News. Many numbers are being added to the extensive line of battery cases manufactured by Acme Model Engineering Co. (Brooklyn 9, N. Y.). New are #17, 18, 19 and 20, which hold one or two of the 30 V batteries such as Eveready No. 506E and 413 respectively. Another new one is #23 for two D cells, and having a simple switch on one end—fine for the small fry and their boats. Coming soon will be holders for three C cells and for three D cells. There will also be a complete line of holders for Mallory and similar mercury cells. Concern also makes extensive line of brass fuel tanks, quite a few of which are designed especially for R/C.

Price of the special T700 Newx escapement made for use with transistors has again been reduced by Newx Products Co. (Box 643, Union, N. Y.); it will sell for \$8.95. It has 800 ohm coil and operates at 25 ma. or less, well within the capabilities of recommended transistors, such as the GE 2N43 or 2N45. Comes with circuits and recommendations for use, and maker will supply data on new applications upon inquiry. Models 506 and 512, for one or two flashlight cells respectively, still available, of course.

Made for rechargeable flashlight use, a new type of alkaline cell the same size as a D dry cell is being produced by Gould-National Batteries, Inc. (Depew, N. Y.). Cells retail for \$7.50 per pair, and concern produces a special flashlight for them and a plug-in charger as well. The cells have an average discharge voltage of about 1.2 V., and an initial capacity of 2.5 ampere-hours. They weigh 4½ oz. each, can be charged completely in 10-12 hours at .5 A rate. Flashlight is designed to hold two cells, but cells may be used for model purposes in any desired combination; they normally come with plain flat ends for spring contact, but may be had on special order with soldering lugs. Cells are completely sealed, hence do not "gas", are of nickel-cadmium construction and warranted for 250 charge-discharge cycles. Due to moderate price, size and weight, these cells appear very useful for electric-drive boats, and many other R/C purposes. Cells or the complete flashlight outfit may be had from Federated Purchaser (66 Dey St., New York 7, N. Y.).

Combination 2 volt vibrator power supply and 2 volt cell charger on a chassis 3½ x 6½ x ¾ high now being made by Electronic Specialty Supply Co. (58 Walker St., New York 13, N. Y.). Unit is intended for those who want to convert dry battery powered transmitters, and sells complete for \$19.95. All connections are made by a 5-pin plug and socket. ESSCO has new design subassembly for converting their own or other two tube receivers to the Cascade-Quad circuit, which uses four diodes. Conversion kit for adapting North American receiver to this circuit is also now in production.

Tiny SPDT and DPDT toggle switch-

es may be had from Torsion Balance Co. (Clifton, N.J.); these units will handle ample current for hobbyist applications and DPDT style retails for \$5.00 each. Body measures about ½" square, is about ¾" high, and neck is ¼" diameter; weight is .22 oz.

Surplus items: 0-1 ma. meter weighing 1.1 oz., with body diameter of 1" and depth of ¾" being sold by Herbach & Rademan Inc. (1204 Arch St., Philadelphia 7, Pa.) for \$5.95 each. Light enough to mount right in your plane, may be shunted to higher current values. . . Avionic Supply (1223 Venice Blvd., Los Angeles 6, Calif.) has several special types of relays as follows; Sigma 7JO—polarized type with SPDT contacts and 5000 ohm coil, sealed; Sigma relay similar to type 5 but with one SPDT and sealed; Sigma 5JO has SPDT screw-adjusted contacts, and total resistance of 10,000 ohms, sealed; Barber-Colman Micropositioner, 40 ohm coil, SPDT contacts with center off, polarized type in clear plastic case; sealed types above come in metal cases with octal bases, may be opened quite easily; any of these types sell for \$2.95 each or two for \$5.00, postage extra. . . Two sizes of storage batteries that may be of interest for electrically-driven boats or for transmitter power supplies are offered by Columbia Electronics (2251 W. Washington Blvd., Los Angeles 18, Calif.); they have a 2 V cell of 12 AH capacity measuring 2¼ x 2¾ x 4" high and a 6V battery of same capacity that measures 6¾ x 2¾ x 4" high; weights and prices of these two types are 1 lb. 10 oz., 4 lb. 12 oz., 49c and \$1.95 respectively; both are unused and come to you dry. Same concern has a small battery charger that will trickle charge 2 V cells, or may be adapted to Silvercells and similar units; it is transformer-rectifier type, and charging rate is adjustable by screwing different size flashlight bulbs in a socket; as sold, it charges a 2 V cell at about 140 ma., and sells for \$1.19.

R/C Boat Installation

(Continued from page 38)

M2 or M3 runs continuously, a pair of size D flashlight cells at B1 should last a long time. B1 must have 3 V., so the cells are connected in series, while B3—the receiver filament supply—must be 1½ V., and here two D cells connected in parallel will do a good job. In a really large boat, you might even consider for B3 what is known as a "Little Six" battery, which gives 1½ V for a long time, and is about ¾ the size of a standard No. 6 dry cell.

While the photo in the May issue shows a small 67½ V battery for B4, you'll get better life with the next larger unit—an Eveready #467 or equivalent. Since there is no drain on B5, the C battery, you can use the smallest size that will give good "shelf life"; Eveready #413 or equivalent is a good choice.

There is only one switch really needed in the installation—SW1; the two sections break the A and B battery circuits of the receiver, and this might well be a DPST toggle or slide switch. Power to all other equipment in the boat is controlled by the receiver relays and by M2, and no switches are really needed for the other circuits. However, we show SW2, the two sides of which open B1 and B2 leads—a wise precaution when you are digging around in the innards of the boat to make repairs or change bat-

series. Another little refinement is P.B.—a single circuit pushbutton that enables you to step M2 around and thus control the drive motor, without having to fire up the receiver and transmitter.

The Babcock BCT-4 transmitter is arranged for controlling model planes, and when the model circuits are arranged as we show them, the "UP" and "DOWN" on the control stick will operate M3 to the rudder, while "LEFT" and "RIGHT" will operate the drive motor. Babcock suggests that the connections to the control lever in the transmitter be changed around so that "LEFT" and "RIGHT" will actually steer the boat.

One reader asked if motor speed control could be worked in with this installation. It could be, of course, and one way would be to replace M2 with a unit that would afford at least one added position, then arrange a pair of electrical contacts to cut in resistance to show M1, when M2 was stepped to this position. The new dmeco 5PN would be adaptable for this, and could also be arranged to provide other control actions as well.

Added parts required—not shown on p. 32, May issue: S—Ceramic disc condenser, .01 mf., CRL type DD; R—Adjustable wirewound resistor, IRC type ABA, 5 ohms; SW1—DPST toggle switch—erroneously listed as SPST in May issue; SW2—DPST toggle switch; P.B.—SPST push button.

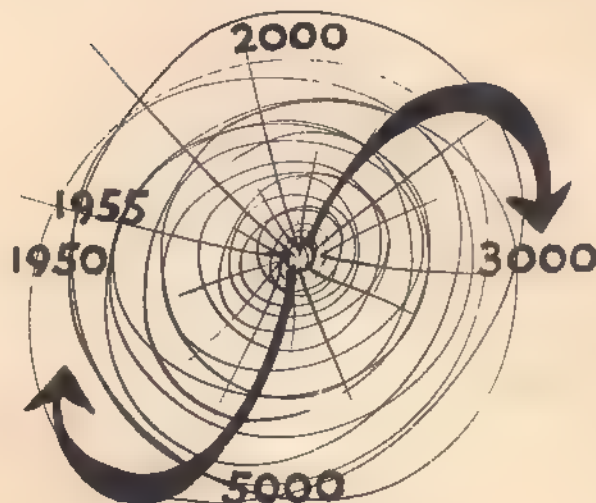
Model Car News

(Continued from page 6)

1234 cars. Class A. 1—Ray Hunter, C-R, 125.52; 2—R. Rasmussen; Arrow, 123.45; 3—Joe Slinkard, own, 119.36. Class BB. 1—Ray Edney, Invader, 107.52; 2—R. Seigmyer, Railton, 105.14; 3—Dan Clark, McCoy, 100.55. Class B. 1—Bob Seigmyer, Invader, 104.40 (new track record for B cars); 2—G. Anderson, Pacemaker, 98.03; 3—Dan Clark, Invader, 93.83.

Some news from Franny Wolfe (513 Vesta Pl., Reading, Pa.); says he has been attending the Micro-Midget big car races (they are a little bigger than our models—just large enough for a driver to squeeze into them) and notes that several ex-model racers are now engaged in this activity, and are doing very well. In a recent race at Leesport, Pa., Franny saw Carl Lieb win and Jack Vannaman come in second; both are former well-known model car bugs. Franny notes that the Reading city fathers finally gave the local control-line plane boys four macadamized flying circles at Neversink Mountain, and next item on the city agenda is supposed to be a model car track. He is pressing to get one that will be tops in every respect including a location where the noise won't bother anyone and safety is the prime consideration. Also work and picnic benches (in the shade), running water and electricity at hand. We hope to hear soon that the track is finished and ready for use. Franny says that Al Scott (104 French St., Elizabethtown, Ky.) has just gotten into model car racing with a few friends and they hope to have a track in operation soon. Brother Wolfe is well-known in car circles for his engine hop-up work, and chrome-plating work, but it is not as well-known that he also does such work for speed demons in the model plane and boat fields; for example, Bob Elliot the Atlanta speedster used one of Franny's chrome liners in his 1954 Nationals

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UC speed winner, while another Georgia fast-traveler — Lamar Parker — took a first at the Southeastern meet this year with a Dooling 29 doctored by Franny.

Finally, Franny writes of two more new tracks, one built by Earl Midgeley at his home (308 Mill Road, Hampton, N.H.) for .19 and .29 cars, and another at Evansville, Ind.—contact K. E. Graig (309 N. Willow Rd.)

Commercial Products. Kit of six different race car construction kits may be had from Best Plastics Corp. (945 39th St., Brooklyn 19, N. Y.) for \$3.98, kits may be purchased individually for 69¢ each. They include Maseratti, Murphy Special, Gilmore, Fuel Injection Special, Monroe, Miller Special.

A very detailed kit for a model sports car is offered by Irwin Corp. (200 Fifth Ave., New York 10, N. Y.). Called Majestic Continental, car operates by remote control, and kit has over 80 parts including die-cast metal chassis, forward and reverse controls, directional signals and electric horn. Retail for \$14.95.

New numbers in the Revell-AMT line are a '55 Ford Convertible and '55 Chrysler New Yorker. Ford model is 5" long, Chrysler is 6 1/4", and both have about 50 very accurately moulded plastic parts. Price of either kit is 98¢. Another new one from Revell is 89¢ kit for a 1936 Cord, one of the Highway Pioneers series. This one has 36 pieces, including two fashionably-dressed riders.

New engine parts for Hornet .19 and conversion kits for Hornet 60 may be had from Franny's Chrome Specialties (513 Vesta Pl., Hyde Park, Reading Pa.).

Fuel shut-off valves and carburetors are again available from Carl Noward (1384 Berdan Ave., Toledo, Ohio), and he can also supply Noward pans, machined or plain gear boxes, and 1234 cars. If there is sufficient demand, a package will be set up whereby a purchaser can procure a pan, machined gear box, finished front and rear axles, tail skid and pan handle stock, plus complete specifications for a finished car; a set of Fairbend gears from an Arrow car, and a magneto plus engine will allow the builder to produce a top racer.

VS-6

(Continued from page 35)

surface-piercing foil craft in Germany in 1936. Guidoni continued his experiments on hydrofoils that same year for seaplanes for the U.S. Navy and National Advisory Committee for Aeronautics.

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The U.S. Navy Convair Sea Dart undoubtedly has benefited from these early hydrofoil experiments. During World War Two several successful hydrofoil combat craft were built in Germany by Tietjens and Von Schertel ranging in size from 17-ton patrol craft to 80-ton tank transports.

All of these used the simple "V" surface piercing foil. The U.S. Navy is currently continuing its experiments in all types of hydrofoil craft including air propeller driven craft that attain 75 miles per hour!

In view of the fact that variable incidence is not practical for models, we selected the surface-piercing "V" foil for our experiments. This design compares favorably with airplane wings with the tips protruding above the surface. The dihedral maintains lateral stability. Note the reverse taper of the hydrofoil. The faster the boat travels the less foil in the water. As the craft slows down and loses height more of the foil area becomes submerged and tends to create more lift to hold the hull aloft. This action creates a very stable model with a minimum of "porpoising."

It has been found that engines under .09 cubic inch displacement do not possess sufficient power to lift a hull this size out of the water. The only point of operation that requires this extra power is when the hull suction breaks and the craft begins the hydrofoil run. Engines from .09 to .14 can be successfully installed in our model. The reader who likes to experiment may care to install a .19 engine and operate the craft on a tether.

Our model is patterned after the speedy World War II patrol craft built in Germany at the Sachsenberg Shipyard and designed by H. F. von Schertel. This was designated VS-6 and weighed 17 tons. A similar Schertel 10-ton craft is now operating on Lake Lucerne, Switzerland as a fast 445 hp passenger ferry attaining 40 knots.

(Further construction details may be found on the full-size plans available.)

Hobby Model World

(Continued from page 45)

Greater Southeasterns, the Ga. Congress of Model Plane Clubs truly had a man-size job.

The idea of a Model Air Circus before one of the Atlanta Crackers' home baseball games was brought to the attention of Earl Mann, Pres. of the Atlanta Baseball Assoc.

Mr. Mann liked the idea and agreed to donate \$250 for each show. So far there has only been one Model Air Circus, but it seemed to be a big hit with the crowd.

Under the able direction of Bill McCain and the combined cooperation of each Atlanta model club, the show was a great success. To begin the show, four circles were ready to go on the starting signal. In center field the Atlanta Team Race Club put on a team racing exhibition. In left and right field, two groups were blazing away at each other flying combat. On the pitcher's mound, precision stunt was flown by Walter Pyron and the author. All four circles were buzzing at the same time.

Southeasterns. With the very fine cooperation of the U.S. Navy and the able direction of the Ga. Congress of Model Plane Clubs, the Greater Southeastern Model Plane Meet turned out to be one

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Two hundred eighty two contestants from all over the southeast and from as far north as Indiana and Ohio attended the four-day meet.

This amounted to a jump of 98 contestants over last year.

A beautiful array of loving cups along with U.S. Saving Bonds and engines were awarded the winners. All first placers received a cup and a \$50 Bond, second place winners received a cup and a \$25 Bond and all third place winners received a cup and a new Torp 35.

Hill Hutchins, Jr. from Spartanburg, S.C. was one of the top winners of the meet. Hill was awarded the Arthur Godfrey Trophy for top performance in stunt and scale for the year 1954. The

replica for 1953 was awarded to George Perryman. Hill also received the Testors Best Finish Award and the Senior High Point Control Line Trophy. After winning the Navy Carrier Event, earlier, Hill put on a fine exhibition of Navy Carrier Landing on Sunday.

The Rickenbacker Sportsmanship award went to Fred Turner of Hapeville, Ga.

For his outstanding work not only in heading up the Southeasterns, but for his everyday help to modelers, the Lockheed Service to Modelers Trophy was awarded to Loyd Wason, our C.D. this year.

The beautiful Jim Walker Radio Control Race Trophy was awarded to James L. Martin.—R. H. Elliott, Jr.

Q/A

(Continued from page 15)

you may be able to furnish addresses of each. There is quite a home-built trend again, thank goodness.

Glenn R. Commons, Eugene, Ore.

• For all information on French home-built airplanes, readers may write to S. A. d'Aviation, Legere et Sportive, 24 Boulevard Victor, Paris, France.

For information on current home-built activity in this country, see the 1955/56 issue of Air Progress, now on sale. Included in this section are many photos and a first-hand report on how one builder "did it."



Hobby Shop Directory

Model Builders! Here's a listing of the nation's leading hobby shops. You'll want to file it away, and when you're in the neighborhood, drop in and browse around. They're expecting you.

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While every precaution is taken to insure accuracy we cannot guarantee against the possibility of an occasional change or omission in the preparation of this November 1955 Index.

K & O Outboard

(Continued from page 77)

volts. Using one 4½ volt Burgess #5360 running time was 90 minutes with power only slightly less.

Analyzing the above from both an economy and weight basis we would rule out the use of pencils because of their short life. Four regular size flashlight cells weigh approximately 15 ounces (less battery box) which we feel is a lot of extra weight for a hull to support for the little difference gained in battery life. The four medium size cells and the single 4½ volt pack battery have the same life. However, although the cost is about the same there is considerable difference in weight. The four medium size cells weigh approximately 6½ ounces less battery box. The 4½ volt pack weighs only 4 ounces and no battery box is necessary.

We would recommend the use of the single 4½ volt battery as the best all purpose battery for use with these electric outboards. For exceptionally long life and if your particular hull can both accommodate and support the additional weight, two of these packs may be wired up in parallel and should then more than triple the time between replacement.

R/C Biplane

(Continued from page 49)

was 8%, and was chopped to 5½%; this cured the tendency completely.

Due to weight and high flying speed it appeared impossible to make glide tests, so power had to be used for R.O.G. take-offs. The plane got off nicely in 125-150 ft. runs, and spring-loaded non-steerable tail wheel enabled fine ground control to be maintained. Each of above-mentioned spiral dives ended at the ground, but the plane did not drop its nose too much—just tightened up the turns, losing a little altitude each time around. These first "landings" caused no damage.

Inside loops, inverted flight, etc., have been found very easy, and while outside loops had not been completed at last reports, the indications are that they will be possible, even though the ship has flat-bottomed airfoils on both wings. No contests have been entered yet, but the plane has been flown in quite a few exhibitions, and has even been operated by Governor "Soapy" Williams of Michigan. Things are speeding up, too; Ernie says he has gotten the Fox up to 9,000 rpm on the same 14/6 prop. Only drawback is high fuel consumption; wide open, it drinks fuel at 2 oz. per minute! With four or five flights on the 7 oz. tank, this kills a quart in short order. And one last problem: Ernie installed the six-channel Bramco receiver, using two channels each for rudder and elevator, and one for motor. This leaves one unused channel—does anybody have any suggestions?

Wicked Witch

(Continued from page 27)

its removal. So—I seal all my tanks in. When something happens necessitating the removal of the tank from the plane built in the manner described, the rest of the model will be so battered that the plane will have to be rebuilt anyhow (Further construction details will be found on the full-size plans.)

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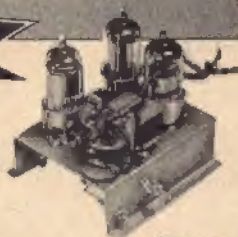
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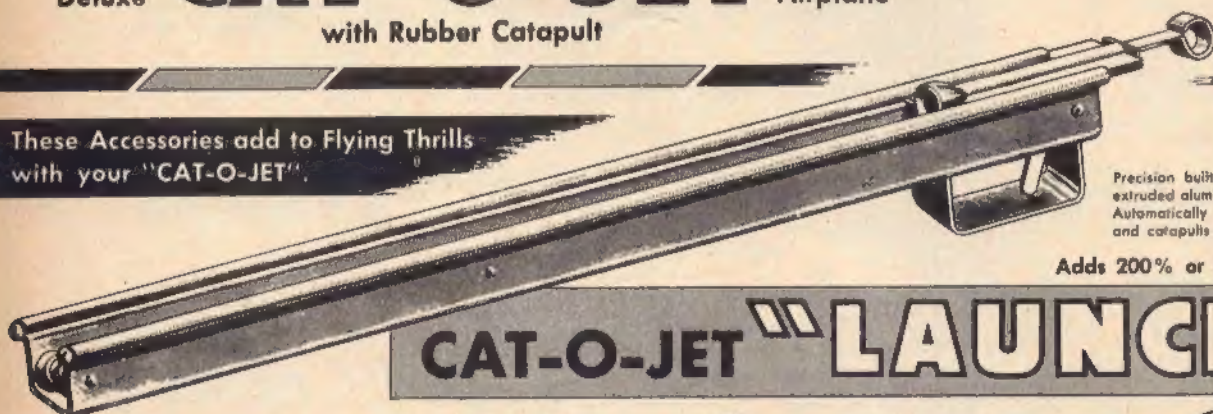
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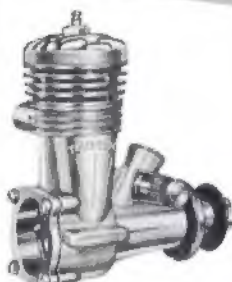
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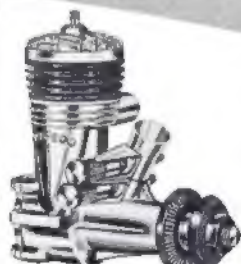
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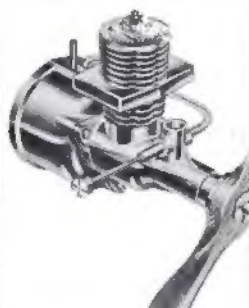
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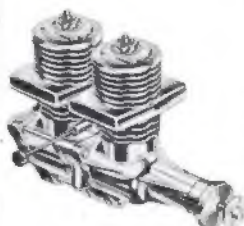
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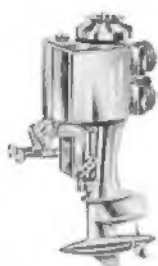
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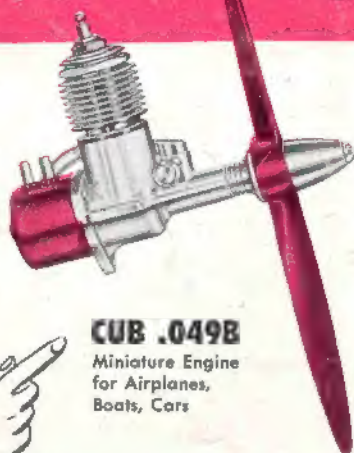


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